THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON. *Telephone*—GERRARD 4314 & 4315. *Offices*—423, Strand, London, W.C.

No. XVII. OF VOL. II., 1928. No. 5487. Vol. CCXV.

LONDON, SATURDAY, OCTOBER 27, 1928

Founded 1823. Registered as a Newspaper. Published Weekly.

Pp. 128—Price 1s.

Annual Subscription Inland £2 2s. Abroad £2 10s

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 2.

BY LIEUT.-COL. ROBERT HENRY ELLIOT
M.D., B.S. Lond., F.R.C.S. Eng., I.M.S. retd.

A TREATISE ON GLAUCOMA.
2nd Edition, Revised and Enlarged. 30s. net.

TROPICAL OPHTHALMOLOGY.
With 7 Plates and 117 Illustrations. 31s. 6d. net.
Spanish and French Editions, 1922. Full German Abstract.

THE CARE OF EYE CASES: 12s. 6d. net.
A MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS.
Chinese Edition. Oxford University Press.

GLAUCOMA 4s. net.
A HANDBOOK FOR THE GENERAL PRACTITIONER.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.
7s. 6d. net. H. K. Lewis and Co., Ltd.

THE TONGUE AND ITS DISEASES.
By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., Ch.M., F.R.C.S.
Pp. xvi., 505.
Illustrated. Price 36s. net.
"It is destined to become a standard work of reference." —BRIT. MEDICO-CHIRURGICAL JNL.
Oxford University Press, Amen House, London, E.C.4.

RADIUM IN CANCER, AND THE SURGERY OF ACCESS.
By ARTHUR B. SMITH, M.B., F.R.C.S.E., SYDNEY M. SMITH, M.B., Ch.B.Ed.
A brief Illustrated Outline of Recent Advances in the Technique of Treatment of Cancer in General Surgery, Gynecology, Laryngology and Dermatology.
With 18 Illustrations. 56 pages. Price 3s. 6d. net; postage 3d.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C. 1.

BY KENNETH M. WALKER, F.R.C.S., M.A., M.B., B.C.

DISEASES OF THE MALE ORGANS OF GENERATION.
Pp. 246. Coloured Plate and 78 Illustrations. 12s. 6d. net.

THE ENLARGED PROSTATE.
Pp. 212. Coloured Plate and 59 Illustrations. 12s. 6d. net.
Oxford University Press, Amen House, London, E.C.4

CANCER OF THE BREAST AND ITS TREATMENT.
By W. SAMPSON HANDLEY, M.S., M.D. Lond., F.R.C.S. Eng.
Second Revised Edition. With 82 Illustrations. 30s. net.
Published for the Middlesex Hosp. Press by John Murray, London.

FOUR EDITIONS IN FOUR YEARS.

LAWRENCE'S DIABETIC LIFE.
By R. D. LAWRENCE, M.A., M.D., M.R.C.P., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital.
NOW READY. 4th Edition. 12 Illustrations. 8s. 6d.; postage 6d.
"A good guide to treatment, and can be warmly recommended." —THE BRITISH MEDICAL JOURNAL.
London: J. & A. Churchill, 40, Gloucester-place, Portman-sq., W.1.

BLUMER'S
BEDSIDE DIAGNOSIS
FOR THE PRACTITIONER
See Saunders' Advertisement on Page 3.

DISEASES OF THE RECTUM AND COLON
AND THEIR SURGICAL TREATMENT.
BY
P. LOCKHART-MUMMERY,
F.R.C.S.ENG., M.A., M.B., B.C.CANTAB.,
Senior Surgeon to St. Mark's Hospital.
Over Two Hundred Plates and Illustrations. Price 25s.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

BY CHARLES J. HEATH, F.R.C.S.,
Consulting Aural Surgeon, Metropolitan Asylums Board; late Surgeon, Throat Hospital, Golden Square, London.
OTITIS MEDIA (MASTOID DISEASE):
ITS SYMPTOMS, DIAGNOSIS, PROGNOSIS AND TREATMENT BY MODERN METHODS, thus saving the hearing of the discharging ear with perforated drumhead.
Price 5s.; postage 3d.
"We have no hesitation in describing Heath's paper as epoch-making."—ST. BARTHOLOMEW'S HOSPITAL JOURNAL.
"This work is recommended to specialists and even to those who are not."—L'OTO RHINO LARYNGOLOGIA INTERNATIONALE.
Baillière, Tindall & Cox, 7 & 8, Henrietta-st., London, W.C.2.

With 25 Illustrations. Demy 8vo. 9s. net; postage 5d.
STERILITY IN WOMEN:
DIAGNOSIS AND TREATMENT.
By SIDNEY FORSDIKE, M.D., B.S. (Lond.), F.R.C.S. (Eng. and Edin.), Surgeon to the Hospital for Women, Soho Square, London; Gynæcological Surgeon to the Kensington, Fulham and Chelsea Hospital, etc.
"... the book can be recommended."—BRIT. MED. JOUR.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

DISEASES OF THE HEART
THEIR DIAGNOSIS, PROGNOSIS, AND TREATMENT BY MODERN METHODS.
With chapters on the Ink Polygraph, Clinical Electro-Cardiography, X-Ray Examination, and Anæsthesia in relation to Cardio-Vascular Affections.
By FREDERICK W. PRICE, M.D., F.R.S. (Edin.).
Physician to the National Hospital for Diseases of the Heart; Consulting Physician to the Royal Northern Hospital, London.
Demy 8vo. Pp. 534. With 249 text figures, including 32 sphygmograms, 92 polygraphic tracings, and 87 electro-cardiograms.
NEW SECOND EDITION 21s. net.

"Dr. Price has accomplished his avowed object of presenting concisely information of service in the diagnosis, prognosis, and treatment of diseases of the heart by modern methods."—BRITISH MEDICAL JOURNAL.
"The most valuable and comprehensive guide to the study of Cardiology with which we are acquainted."—NEW YORK MEDICAL JOURNAL AND RECORD.
"We think that most of our readers engaged in general practice will find this work extremely useful."—THE JOURNAL OF CLINICAL RESEARCH.
"In our opinion the book is indisputably the most authoritative contribution to Cardiology of our time."—FRANCO-BRITISH MEDICAL REVIEW.
"The second edition of this popular work on heart disease bears evidence of thorough revision, while the essentially clinical standpoint of the writer is maintained."—EDIN. MED. JOUR.
"A book which we believe is destined to remain the standard work on Cardiology for many years to come."—AMERICAN MEDICINE.
"It may be said at once that the book adequately fulfils the purpose it has in view and is a perfectly sound, lucid, and reliable guide."—NEWCASTLE MEDICAL JOURNAL.
"Well-written, concise, and complete, containing a wealth of practical information. Obviously based upon the author's own experience and investigative work."—SURGERY, GYNECOLOGY, AND OBSTETRICS (Official Journal of the American College of Surgeons).
"Dr. Price is to be congratulated again on the reappearance in its second edition of his distinguished contribution to the increasingly important subject of Cardiology."—THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

OXFORD UNIVERSITY PRESS, Amen House, Warwick Square, London, E.C. 4.

"CIBA" BRAND

OVARIAN PREPARATIONS OF SPECIAL IMPORTANCE.

STANDARDISED OVARIAN HORMONE

SISTOMENSIN

Indicated in Dysmenorrhœa, Menorrhagia, Menopause (natural and artificial), Hypoplasia of the Uterus, Infantilism, Sterility, etc.

Ampoules and Tablets.

HYDROSOLUBLE OVARIAN SUBSTANCE

AGOMENSIN

Of value in Functional Amenorrhœa, Oligomenorrhœa, Vomiting of Pregnancy, etc.

Ampoules and Tablets.

OVARIAN HORMONE COMPOUND

PROKLIMAN

Tablets for the treatment of Climacteric Disorders.

Bottles of 40 and 100.

TRADE MARK *Registered*

Samples and Clinical Reports to Physicians on request.

THE CLAYTON ANILINE CO. LTD.
PHARMACEUTICAL DEPARTMENT
40, SOUTHWARK STREET, LONDON, S.E.1.
Telephones: HOP 6954, 6955. *Telegrams:* CIBADYES BOROH LONDON

ZŌPLA STRAPPING IS ALWAYS READY FOR USE

It keeps without deterioration and is instantly self-adhesive.

It exerts a powerful grip and does not slip.

On various cloths and felts. WRITE FOR SAMPLES.

Manufacturers of the Original Holland Strapping.

LESLIES LTD., High St., WALTHAMSTOW, LONDON, E.17

THE LANCET

No. 5487. LONDON, SATURDAY, OCTOBER 27, 1928. CCXV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on Microbic Dissemination in Schools. By Surg.-Com. SHELDON F. DUDLEY, M.R.C.P., D.P.H.—(*Illustrated*) ... 849

ORIGINAL ARTICLES

Radiological Treatment of Cutaneous Basal Cell Carcinoma with Resulting Tissue Changes. By J. B. HIGGINS, M.B.—(*Illustrated*) 856

Exercise Tests in Pulmonary Tuberculosis. By ALEX. COOPER, M.B., and DOROTHY DOW, M.B. .. 859

Traumatic Epilepsy after Gunshot Wound of the Head. By W. W. WAGSTAFFE, F.R.C.S. 861

CLINICAL AND LABORATORY NOTES.

True Diabetes Mellitus Complicated by Pregnancy. By N. M. GOODMAN, M.B. 862

Traumatic Rupture of the Spleen in an Elderly Man. By L. DIGBY NELSON, M.B. 863

MEDICAL SOCIETIES.

Medical Society of London: Diagnosis and Treatment of Empyema 863

National Association for the Prevention of Tuberculosis: Antituberculosis Measures 865

Tuberculosis Association: Artificial Pneumothorax 867

Medical Officers of Schools Association..... 868

International Society of Medical Hydrology: Spa Treatment of Children.—Rheumatism as a National Problem 869

Royal Society of Medicine: Section of Medicine: Hypochondria 871

NEW INVENTIONS.

A Spring Clip for Skeletal Traction. By C. MAX PAGE, F.R.C.S.—(*Illustrated*) 874

REVIEWS AND NOTICES OF BOOKS.

Sterility in Women: Diagnosis and Treatment. By Sidney Forsdike, F.R.C.S. 872

Common Principles in Psychology and Physiology. By John Maccurdy, M.D. 873

Principles of Abnormal Psychology. By Prof. E. S. Conklin..... 873

A Treatise on Kala-azar. By Upendranath Brahmachari, M.D. 873

Food, Health, Vitamins. By Prof. R. H. A. Plimmer, D.Sc., and Violet G. Plimmer 873

Atomic Structure as Modified by Oxidation and Reduction. By W. Colebrook Reynolds, D.Sc... 874

The Life of the Cell. By D. L. Thomson, B.Sc. .. 874

American Journal of Obstetrics and Gynecology 874

LEADING ARTICLES.

PUBLIC HEALTH AND LOCAL GOVERNMENT 875

BACTERIAL SYMBIOSIS 875

A NEW TEST FOR PREGNANCY 876

AN ANACHRONISM 876

ANNOTATIONS.

Rheumatism as a National Problem 878

The Welfare of the Deaf .. 877

Current Problems in Tuberculosis 878

Hospital Expenditure 879

The Wisdom of Peter Harding 879

Infectious Disease in Ireland 879

The Risks of Inducing Pneumothorax..... 880

The Rockefeller Foundation and Medical Education 880

A Centenary and a Congress in Egypt 881

Diabetes and Pregnancy .. 881

Halloween, 1828 881

MODERN TECHNIQUE IN TREATMENT.

CCLXXXVI.—The Treatment of Gastric and Duodenal Ulcer after Subsidence of Acute Symptoms. By T. IZOD BENNETT, F.R.C.P..... 882

SPECIAL ARTICLES.

Eighteenth Annual Congress of the American College of Surgeons (Boston)..... 885

Ministry of Health: Annual Report of the Chief Medical Officer, 1927: Prevention of Heart Disease.—Venereal Disease: The Question of Compulsory Treatment.—(*To be continued*) 887

Ireland: The Censorship of Publications 888

Berlin: Control of Venereal Disease 889

United States of America: Indoor Ultra-violet 890

Centenary of King's College: Work of the Medical Faculty 891

British Medical Association: Council Dinner .. 891

CORRESPONDENCE.

"Hypervitaminosis" and "Vitamin Balance" (Mr. Leslie J. Harris and Mr. Thomas Moore) 892

Vaccination Reform (Dr. J. Walter Carr)..... 893

Deaths under Anæsthesia (Dr. R. J. Clausen) 894

A Census of Blind-and-Deaf Children (Mr. A. J. Story) 894

Fee-Splitting (Dr. R. Earp) 894

Hæmatological Abstracts (Dr. A. Piney) 894

Welfare Work and the Practitioner 894

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service..... 895

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Hull.—Cardiff..... 895

Infectious Disease in England and Wales 896

OBITUARY.

Alexander Napier, F.R.F.P.S. 892

MEDICAL NEWS.

University of Glasgow.... 897

University of Dublin 897

University of Edinburgh.. 897

Royal College of Surgeons of Edinburgh..... 897

Royal Medical Benevolent Fund 856

London Fever Hospital .. 872

Donations and Bequests.. 882

Fellowship of Medicine and Post-Graduate Medical Association..... 882

University of Leeds 884

East Suffolk and Ipswich Hospital 891

Royal Dental Hospital of London 897

Royal Institution of Great Britain 897

A Convalescent Hospital at Preston 897

University of London Medical Graduates Society 897

Extension of Glasgow Royal Infirmary 897

Liverpool Annual Medical Service 897

London Hospital Dinner.. 897

Overcrowding at Sheffield Infirmary 899

Hospital Tickets at Rugby 902

NOTES, COMMENTS, AND ABSTRACTS.

Nervous Disease and its Significance in Industry. By MILLAIS CULPIN, M.D., F.R.C.S. 899

Immunising Dogs against Rabies..... 902

Cored Carbon Arcs 902

Medical Diary 898

Appointments 898

Vacancies 899

Births, Marriages, Deaths 899

J. & A. CHURCHILL

The Recent Advances Series.

OGILVIE'S SURGERY. 108 Illustrations. **15s.**
PEARSON AND WYLLIE'S DISEASES OF CHILDREN. 50 Illustrations. **15s.**
SIR LEONARD ROGERS' TROPICAL MEDICINE. 13 Illustrations. **12s. 6d.**
WOOLLARD'S ANATOMY. 4 Col. Plates and 73 Text-figures. **12s. 6d.**
BEAUMONT AND DODDS' MEDICINE. 4th Edition. 46 Illustrations. **12s. 6d.**
PINEY'S HÆMATOLOGY. 4 Plates and 18 Text-figures, 2nd Edition. **12s. 6d.**
EVANS' PHYSIOLOGY. 3rd Edition. 86 Illus. **12s. 6d.**
BOURNE'S OBSTETRICS & GYNÆCOLOGY. 67 Illus. 2nd Edition. **12s. 6d.**
PRYDE'S BIOCHEMISTRY. 2nd Edition. 38 Illus. **12s. 6d.**
DUKE-ELDER'S OPHTHALMOLOGY. 4 Col. Plates. 73 Text-figures. **12s. 6d.**

By HENRY JELLETT, M.D.,

Late Master, Rotunda Hospital, Dublin.

Practice of Gynæcology
5th Edition. 417 Illus. 15 Col. Plates. **25s.** Postage 9d.

Short Practice of Gynæcology
5th Edition. 381 Illus. 10 Col. Plates. **18s.** Postage 9d.

Short Practice of Midwifery
9th Edition. 263 Illus. 4 Col. Plates. **18s.** Postage 9d.

Short Practice of Midwifery for Nurses
7th Edition. 175 Illus. 4 Col. Plates. **8s. 6d.** Postage 6d.

London: J. & A. CHURCHILL, 40, Gloucester Place, Portman Square, W.1

OXFORD MEDICAL PUBLICATIONS

APPLIED PHYSIOLOGY

By SAMSON WRIGHT, M.D., M.R.C.P.

With Introduction by SWALE VINCENT, M.D., LL.D., D.Sc., F.R.S. (Ed. & Camb.).

Pp. 538, with 108 Illustrations in the text, and one coloured plate.

New (2nd) Edition. 18s. net.

Telephone: CITY 8966. Extension, Dept. R
Telegrams: OXUNIPRES, CENT, LONDON

LIPIODOL IN THE DIAGNOSIS OF THORACIC DISEASE.

By F. G. CHANDLER, M.A., M.D.(Cantab.), F.R.C.P.(Lond.), and W. BURTON WOOD, M.A., M.D.(Cantab.), M.R.C.P.(Lond.)

Pp. 141. 47 Skiagraphs. 10s. 6d. net.

(At the Clarendon Press)

DEGENERATION AND REGENERATION OF THE NERVOUS SYSTEM.
By S. RAMON Y. CAJAL, M.D., F.R.S., Director of the Cajal Institute, Madrid.
Vol. I. Traumatic Degeneration and Regeneration of the Nerves. Pp. 416. 146 Illustrations.
Vol. II. Degeneration and Regeneration of the Nerve Centres. Pp. 380. 170 Illustrations.
} The set 50s. net.

GYNÆCOLOGY WITH OBSTETRICS.
By JOHN S. FAIRBAIRN, M.A., B.M. (Oxon.), F.R.C.P. (Lond.), F.R.C.S. (Eng.)
New (2nd) Edition. Pp. 810. 167 Illustrations. 25s. net.

THE ROBERT JONES BIRTHDAY VOLUME.
(A collection of Surgical Essays.)
With a Preface by Sir Berkeley Moynihan, Bart., K.C.M.G., C.B.
Pp. 446. 355 Illustrations. 42s. net.

THE PNEUMOTHORAX AND SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.
By CLIVE RIVIERE, M.D., F.R.C.P.
2nd Edition. Pp. 334. 9 Illustrations. 16 Plates. 10s. 6d. net.

SPECIAL CYTOLOGY.
Edited by EDMUND V. COWDRY (of the Rockefeller Institute for Medical Research).
Vol. I., pp. 717. 296 Illustrations.
„ II., pp. 637. 369 Illustrations.
The set 94s. 6d. net.

CARDIAC ARRHYTHMIAS.
By IRVING R. ROTH, M.D., with an introduction by EMANUEL LIBMAN, M.D.
Pp. 222. 80 Illustrations. 36s. net.

RENÉ THEOPHILÉ HYACINTHÉ LAENNEC. A Memoir.
By GERALD B. WEBB, M.D.
Pp. 165. 13 Plates. 8s. 6d. net.

METHODS OF BIOLOGICAL ASSAY.
By J. H. BURN, M.A., M.D. (Cantab.). With an introduction by H. H. DALE, C.B.E., Sec.R.S., M.D., F.R.C.P.
Pp. 146. 22 Illustrations. 8s. 6d. net.

New Catalogue Free *Upon Application.*

The Oxford University Press

HUMPHREY MILFORD. Dept. R., Falcon Square, London, E.C.1

(And of all Booksellers).

An Address
ON
MICROBIC DISSEMINATION IN SCHOOLS.

Delivered before the School Medical Officers Association on Oct. 19th, 1928,

BY SHELDON F. DUDLEY, O.B.E., M.D., M.R.C.P. LOND., D.P.H.,
SURGEON-COMMANDER, R.N.; PROFESSOR OF PATHOLOGY, ROYAL NAVAL COLLEGE, GREENWICH.

NAVAL and school medical officers have practically the same duties to perform and have to divide their attention equally between clinical and preventive medicine. That is to say, they have to treat the herd as a whole, as well as the individual members of it. School and ships' officers are in medical charge of semi-isolated communities, the members of which live together in much closer communion than is common in the world outside. For this reason the opportunities for bacterial spread, once an infection has been introduced, are generally greater in semi-isolated communities than outside them. Therefore microbic dissemination is of special interest to the school doctor.

THE HARDSHIPS OF PARASITIC BACTERIA.

The spread of any species of living organism, from one habitat to another one which is suitable for its maintenance, involves two processes. First there is the necessity of finding transport for the dissemination of the organism in space, and secondly the species has to establish itself successfully in the new environment when found.

As compared with free-living organisms, parasites have an extra difficult task in finding new habitats or hosts. Moreover, if the parasite is of a disease-producing species its case is even still harder, for whereas a harmless commensal is generally tolerated by any host of the right species who allows it to live in peace for an indefinite time, the pathogenic microbe, after successfully crossing the gap to a new host, may be unable to colonise the new found home owing to the opposition it arouses. Even when successfully established, life for the malignant bacterium is further complicated, because since a pathogen raises the antagonism of its host, a disease-producing organism has to work against time in order to disperse its species to another host before being destroyed by the first one getting well of his illness. Also, should a microbe kill its host so rapidly as to prevent its own dissemination to fresh victims, it commits race suicide and causes the extinction of that line of the parasitic family. In this way the most virulent races of bacteria soon exterminate themselves. Pathogenicity in the abstract is a sign of maladaptation to the environment; hence if a species of parasitic bacteria exists as a virulent and an avirulent variety, the usual practice of calling the latter a degraded, or degenerate, type of the former is most inconsistent. In every case where this happens the so-called degraded form is, biologically speaking, the really successful variety of the species; if success in parasitic life is defined by the number of hosts infected and the duration of their occupation. Also the moral of calling visitors degraded, just because they do not assault their host, is surely not a good one.

AIR-BORNE INFECTION.

Owing to the difficulties in colonising fresh habitats the methods used by pathogenic organisms to transport themselves across the gap between one host and the next are many and various, and the chief successes of preventive medicine have been the discovery and frustration of the methods of parasitic dissemination. For example, the efficiency of sanitation is due to the fact that clean food and water, combined with a sound conservancy system, have raised a barrier between the human egesta and ingesta which the intestinal pathogens can rarely penetrate.

There is a large group of parasites who spread in droplets of the secretions of the infected host. These droplets, with any bacteria who are using them as a vehicle in which to travel to a new host, are sprayed into the air in the act of talking, coughing, sneezing, and snoring. This method of bacterial dissemination in droplets is by far the most important in civilised communities, not because other vehicles of infection, such as dirty milk or water, are not potentially capable of conveying just as much disease to the herd as droplets, but because there are no practical methods of preventing pathogenic microbes from successfully using these droplets for their transport. Whereas, at the present time, a big typhoid or cholera outbreak in England is only due to the indifference or ignorance of the public, or its medical advisers, to the known facts, we are still almost as helpless as our ancestors were in defending ourselves from a droplet-borne epidemic. For this reason I shall confine my discussion almost entirely to droplet- or air-borne infections.

The only way to avoid droplets entirely is complete isolation from one's fellow men, or the constant wearing of a respirator. Although the use of the latter is a wise precaution for those who have to attend such virulent droplet infections as pneumonic plague, or streptococcal influenza, yet it is scarcely feasible to keep a whole school, or ship's company, constantly in gas masks.

Since there seemed no other way of preventing "air-borne" diseases, our grandfathers hoped to control the spread of these infections by the segregation of all those who were attacked by them. After a trial of many years' duration the general consensus of opinion now is that the isolation of infectious disease has had no effect in diminishing its morbidity as a whole, whatever effect may have been produced on the age-distribution, or severity, of infection. The failure of isolation in checking the prevalence of infectious diseases is mainly due to two facts. First the victims of many diseases are more infectious in the early than late stages of their illness, and thus have usually passed their parasites on to others by the time they are segregated. After all, from a priori biological principles, this is only to be expected; a race of bacteria which spreads by droplets is not likely to have much success in the struggle for existence if its victims are rendered immobile, before their parasites get a chance of dispersal. The second reason for the failure of isolation is that many infectious diseases are accompanied by a multitude of hosts who show no evidence of infection. These are the so-called contact and chronic carriers. Carrier is really a bad name for people who have symptomless infection, because they only differ from cases in degree, and the problem to the microbe of finding a new habitat is fundamentally the same whether the old one is called a case or a carrier. Moreover, the term has led to the confusion of the rôle played by the tolerant host, in the spread of infection, with the part played by such things as flies, dirty linen, or droplets, which are more literally carriers or transporters of disease than a tolerant host. However, since it is obvious the term "carrier" has come to stay, after registering this protest I shall talk about carriers in the usually accepted sense.

"CARRIERS."

The importance of carriers lies in their elusiveness; they are often not suspected, and even if they are the laboratory examinations which may be undertaken for their discovery often yield negative results. Also the carrier retains his full mobility and mixes just as usual with his fellows. Sick animals, including man, creep away to their lairs and to some extent automatically isolate themselves from the rest of the herd. It is still not commonly realised how numerous the carriers of certain bacteria can be in a suitable environment. Without examination the statement

that during a certain year the virulent carrier rate in the London County Council schools was 2 per cent., while at the same time the morbidity-rate for diphtheria was 100, conveys a vague impression that cases of diphtheria were more common than carriers, because the number 2 is seen in relation to the number 100, and although, of course, everyone realises the two forms of expression are different, yet only a few who may be especially interested will take the trouble to make the necessary calculation to determine the real ratio of carrier to case infection that such a statement as the above indicates. A 2 per cent. carrier-rate for a year means that there were on the average two carriers always present in every 100 of the population. These two carriers were not always the same individuals, since the carrier state is usually of short duration. A rather liberal estimation makes the average carrier state to last three weeks; according to this estimate the carriers in the population as a whole changed over 17 times during the year, and therefore a 2 per cent. rate meant that 34 per cent. of the population were infected as carriers during the year. On the other hand, a morbidity-rate of 100 per 10,000 per annum meant only 1 per cent. of the population were infected as cases in the year. Hence the original statement implies that carriers were 34 times as numerous as cases in the L.C.C. schools.

Diphtheria has been used to illustrate the preponderance of symptomless over symptomatic infections because in this complaint many exact data are to hand. There is every indication, where there are sufficient observations on the point, that a high ratio of carriers to cases exists in many other bacterial infections, as, for example, influenza, pneumonia, infantile paralysis, or simple sore-throat. It should now be clear that isolation has failed to control the spread of infectious diseases, mainly because it is impossible to discover and control *all* the infected hosts. The attempted removal of infected hosts has met with small success even in animals, other than man, as is well shown in two very important diseases which are caused by bacteria which are adapted to live in another mammal as well as man. In tuberculosis we are still unable to prevent the cow passing on tubercle bacilli to English babies, while in the streets of Valetta we see that perambulating culture of *Brucella melitensis*, which is also known as a goat, milked on the doorsteps of the houses, and the resulting subculture handed straight to the baby; surely no pathogenic parasite has an easier passage across the gap between host and host. And although probably all Maltese babies are weaned on cultures of *B. melitensis*, the causative parasite of undulant fever, yet many survive. Moreover, symptomatic undulant fever in Maltese infants is very rare. (The infantile mortality-rate for Malta in 1923 was 280, but scarcely any of it is attributed to undulant fever.) Thus, although the parasites easily cross the gap between the goat and the baby, yet they seem to find Maltese infants unsuitable hosts in which to establish themselves since they are rarely able to provoke the characteristic reaction termed undulant fever. The escape of Maltese babies from attacks of Malta fever while feeding on cultures of its causative organism is, to my mind, one of the most astonishing natural adaptations of a human herd to its environment, and since I know no more convincing proof that certain human beings can imbibe huge doses of a definite pathogenic microbe which can infect the ordinarily susceptible person by the mouth more easily than most bacteria, I have used this everyday domestic scene in Malta to cross the gap from the distributor to the receiver of disease germs and to introduce the concept of host resistance to parasitic invasion.

VACCINES.

For centuries it has been known that an attack of certain diseases confers immunity against subsequent infection. This observation led the Chinese to use the nasal installation of matured small-pox crusts and Jenner to employ cow-pox inoculation, in order that by giving the subject a mild attack of the disease he would be rendered immune to small-pox in the future. Later, inoculation with dead microbes, or their products, was devised as a prophylactic against attacks by the same living bacteria. Prophylactic vaccines give rise to changes in the host which are similar to those produced by the disease they are intended to prevent, as witness the Widal reaction, which is produced equally well by a dose of dead typhoid bacilli or an attack of typhoid fever. That the inoculation of dead microbes really does raise the resistance to attack by the same species of living bacteria has been clearly proved by animal experiments; but the degree and duration of immunity produced varies over a wide range according to the races, or species, of the bacteria which are used to make the vaccine. Although the principle of raising the defence of the herd against bacterial attack and of ignoring the distributor of pathogenic organisms, and their means of dissemination, has met with a dramatic success in a few disorders such as small-pox and diphtheria, yet on the whole vaccine prophylaxis has been disappointing, especially in the group which may be conveniently termed the minor respiratory infections. These complaints, which comprise those clinically indefinite ailments entered under the headings "influenza," "chill," "colds," "febricula," "bronchitis," and "simple sore-throat," seem to confer little immunity against subsequent attack, which may be one cause of the difficulty of finding an efficient prophylactic vaccine against them. Also practically nothing definite is known about their bacteriological and clinical correlations. This is well illustrated by the fact, that in spite of all the labour that has been expended in the study of epidemic influenza, there is no consensus of qualified opinion as to whether the parasitic virus is filtrable or not, whether the disease is caused by more than one distinct race of parasite acting symbiotically, or even if we are dealing with a single clinical entity. If you do not know the parasites which cause a complaint, or even the complaint when you see it, it is hard to produce a successful vaccine against it. A broad survey of the available statistics on the use of anti-catarrh vaccines in ships and schools forces one to the conclusion that in the aggregate there is little definite evidence that vaccines have had much appreciable effect on the incidence of the minor respiratory diseases. It seems, therefore, in the present state of knowledge, that little impression can be made on the incidence of the minor droplet infections by attempts to isolate the distributors of them or increase the immunity of their receivers by means of a vaccine.

THE NATURE OF DROPLET INFECTION.

In order to see if there is a way of escape from this impasse let us consider briefly the mechanism of droplet infection. These droplets are real things. By coughing, or sneezing at, microscope slides, and staining the result, all sizes of droplets can be seen, some visible to the naked eye containing many cells and hundreds of bacteria, some of microscopic dimensions with only a single cell, or one or two microbes, in them, while others are apparently sterile. The mechanism of their distribution in space can be simply imitated by a puff of tobacco smoke. The explosive jet of smoke only proceeds for a foot or two according to its initial velocity, and is then rather suddenly brought up by the resistance of the air. The smoke then gathers into a cloud which disperses in the prevailing air currents. It is easy to prove experimentally, by using plates of culture media and an harmless index organism which forms characteristic red colonies on culture (*B. prodigiosus*), that exactly the same thing happens, with the spray of droplets ejected by sneeze or cough, as happens with the tobacco smoke. Only that the explosive jet of droplets from the sneeze also contains many relatively heavy particles, including actual lumps of phlegm or muco pus. These heavy particles all drop to the ground, within two or three feet, as soon as the propulsion force of the sneeze or other expiratory

effort ceases; but the smaller droplets which only contain a fraction of the total mass of infective material in the original sneeze may remain suspended in the air for half an hour or more according to the atmospheric humidity and temperature, and may be carried to almost any distance according to the force and direction of the prevailing air currents. This mechanism explains why "contact" has usually to be fairly close in order to catch an infectious disease. In many instances only the explosive preliminary jet of heavy droplets will contain enough infective material to cause illness. The fine mist of droplets, though more persistent and widespread, is generally too dilute to do harm.

Minimal Effective Doses.

These remarks imply that dosage of infective material is a factor in contracting a microbic disease. In general a certain minimum number of bacteria are necessary in order to break through the natural defences of any animal. Susceptible and immune are relative terms. Probably there are no completely susceptible individuals, because that would mean one bacterium was adequate to initiate an infectious disease. Conversely many, who may be immune from attack by the ordinary doses of infection they meet, may succumb when they make contact with bigger doses of bacteria than they are accustomed to—as, for example, when boys leave home for school. Thus each individual of a herd has a special degree of resistance, which can deal with quantities of bacteria below a certain minimum number. This hypothetical number is incapable of exact measurement. It varies relatively and actually in every member of the herd and with every race of bacteria. Moreover, it probably changes hourly and yearly in the same individual. Any number of microbes less than the minimal infective dose will be destroyed by the host, and is for him a subinfective dose. The mechanisms by which hosts destroy noxious parasites would take a few weeks to discuss; but special interest in infection by inhaled dust or droplets is the bactericidal power of the nasal mucosa. Recently Arnold Ostrom and Singer [1] have shown that 90 per cent. of the *B. coli* in an experimental dose are destroyed within 15 minutes of their instillation into the human nose. The specific parasites of disease are probably not disposed of so easily, but undoubtedly the nasal filter is a valuable first line of defence against air-borne infection.

The conception of minimal infective doses and subinfective doses indicates that it may sometimes take time to collect sufficient material to initiate an infection. If more than the minimal infective dose is received instantaneously, as may well happen if a boy receives the full blast of a sneeze in his face, infection is contracted at once. On the other hand, if a boy receives a subinfective dose he proceeds to destroy it and no illness results. If, however, he receives a further sub-infective dose, before the first is completely inactivated, successful infection will depend on whether the remains of the first dose, added to the second, exceeds the minimal infective dose. Under such circumstances infection depends on the spacing of subinfective doses. When the intervals are long enough to permit destruction of one dose before the next is received no illness occurs, but when the intervals are too short infective material will accumulate and, should the subject stop long enough in such an environment, he will collect enough bacteria to initiate infection. In the atmosphere of a crowded room the inhalation of infective droplets must often be almost continuous, and their destruction likewise so, and if the latter process does not exceed the former, catching infection will depend on how long a stop is made in the infected atmosphere.

THE "VELOCITY OF INFECTION."

Shortly stated, the time necessary to contract infection is the minimal infective dose divided by the difference between the rate at which infective material is received and destroyed. This differential rate may be called the velocity of infection.[2]

I originally evolved this hypothesis to try to explain the extraordinary fact that the day boys at Greenwich Hospital School remained completely free from diphtheria and scarlet fever during a period in which over 300 infections by these disorders were notified among the residents. The chief difference between the day boys and residents was that the latter spent ten hours at a stretch in their dormitories, while the day boys slept at home. There was much other evidence which also incriminated the dormitories as the principal places where infection spread; thus I arrived at the conclusion that one to one and a half hours' contact in the class-rooms and the closer but shorter contacts in the playground did not give sufficient time for the day boys to collect enough bacteria to cause symptomatic infection. On the other hand, the ten hours in the dormitory was able to give the time required. Moreover, the velocity of infection is probably the chief factor in determining whether a bacterium establishes itself in the host or is destroyed before it can multiply. Also, if establishment is successful, the velocity of infection still determines whether a symptomatic or symptomless infection results—i.e., whether the host becomes a case or a carrier. All these possibilities—symptomatic infection, carrier infection, or destruction without multiplication—mean that bacteria have been absorbed by the tissues. Experimental work on vaccines demonstrates that the absorption of bacteria and their products can cause an increase in immunity to the corresponding disease. Therefore atmospheres, which support droplets containing specific pathogenic bacteria, act as vaccines and augment the resistance to disease of those who breathe them. In this way in schools and ships large numbers of the inhabitants acquire immunity without symptoms of illness by inhaling subinfective doses of bacteria, or even possibly their dead products in the atmospheric dust. This is the natural process of auto-vaccination.

LATENT IMMUNISATION.

In 1922 I showed that when diphtheria was epidemic large numbers of boys who had no history of diphtheria acquired human diphtheria antitoxin in their blood.[2] This observation has since been confirmed by Lereboullet [3] and Friedemann.[4] The mechanism of the process of natural immunisation may or may not involve actual latent infection. If actual carrier infection is essential there are more than enough diphtheria carriers to satisfy the hypothesis. On the other hand, mere destruction of infective material without actual production of the carrier state may suffice, as is indicated by the work of Monckton Copeman [5] and others who have successfully immunised children by application of diphtherial products to the mucosa of the nose or throat, and of Pockels [6] who claims to have produced immunity by giving children suspensions of dead diphtheria bacilli to drink.

A careful study of the epidemiological data of many other infections more and more confirms me in the opinion that this process of latent immunisation is of widespread general occurrence. I used to instance measles as one of the few exceptions to the general rule; that immunity could be acquired without any definite illness. The attack-rate of measles epidemics on a completely virgin soil approaches 100 per cent., as was seen in the epidemic in Fiji of 1875. This is strong evidence that not much auto-vaccination can take place on such occasions. However, in 1913 Butler [7] pointed out that, in Marlborough College, a past history of measles was not sufficient to account for the escape of all the survivors of the epidemic and gave good reasons for thinking the absence of history could not in every case be due to bad memory or false diagnosis. Butler therefore suggested exposure to "attenuated or minor doses of infection" to account for the apparent immunity of some of these public schoolboys. Thus Butler 15 years ago enunciated the theory of natural vaccination from a study of the one disease I used to use as an example of its non-occurrence. More recently Halliday [8] has analysed the

spread of measles in Glasgow, and thinks that "infinitesimal doses" of measles virus were received "in such a way and at such intervals of time as to build up an immunity." Even measles therefore may fall into line with the other droplet-borne diseases in which immunity may be acquired instead of illness, provided the infective material is not received too fast.

Immunity following Colds and Influenza.

It is often assumed that an attack of influenza or one of the other minor respiratory diseases confers no subsequent immunity. Yet herds as distinct from individuals show marked resistance to the spread of these infections. Nobody who has lived in ships with his eyes open and has seen a ship's company turned in for the night can believe that those who are not attacked by a droplet-borne epidemic in a ship escape because they have avoided all contact with the infective agents. Even in the big influenza epidemic of 1918 50 per cent. or more of a ship's company generally escaped attack.[9] Since 1918 there have been many minor influenza epidemics in ships, all extremely mild clinically and rarely attacking more than 10–15 per cent. of the ship's complement. Also, although the cases were always distributed throughout all parts of the ship, which showed that the infection was general, yet more than 80 per cent. of the men had sufficient resistance to absorb all the doses of influenza virus which they must have received without suffering from any apparent ill-effects. The same distribution and the same escape of the majority can also be seen in outbreaks of simple sore-throat and even colds in the head.

The reasons why the impression that attacks of the minor respiratory ailments can confer no increase of resistance is so general are that many individuals get attacked over and over again at short intervals; on the other hand, many do not; but it is the former group that impresses itself on the attention of medical men. In such a trivial infection as the common cold reliable statistics are hard to come by, because probably not 5 per cent. of colds cause incapacity for work, are remembered by the victim, or seen by a doctor. Also in such a ubiquitous and recurrent condition it is impossible to estimate an increase in herd immunity by the absence of subsequent attacks; but if it could be shown that the frequency of colds varied inversely with the amount of previous bacterial experience it would be good evidence that herd immunity to the minor respiratory diseases could be increased. My own work has shown that the attack-rate for influenza is greater among recruits than seasoned men [10] living under the same conditions, and also that the other minor respiratory infections which were sufficiently severe to cause an entry on the sick lists are three times as common in training establishments as in sea-going ships, though the latter have a much denser population.[11] Very interesting evidence that herd immunity to the minor respiratory diseases can be acquired is also to be gleaned from the reports of the United States Public Health Services.[12] In a sample of the population a census was taken of all the colds in the head that occurred during the course of one year. The results indicated that, between infancy and 20 years of age, the frequency of "colds" falls from an average of over two colds per person per annum to under one per year.

Definite evidence on the point that any increase in herd immunity, however small in degree, does occur by natural infection in the minor droplet-borne diseases is of paramount importance, because it encourages perseverance in the search for an efficient prophylactic vaccine against these ailments by imitating and improving on the natural process.

The Example of Diphtheria.

In order to show what might be possible in the future if a really good anti-catarrh vaccine could be discovered, I have made Fig. 1 to represent what can be done now with a diphtheria prophylactic. This diagram represents what happens to an average sample of 100 Schick-positive reactors (i.e., individuals with a low resistance to diphtheria), when they are exposed to a natural diphtherial environment, compared with the results of inoculation with diphtheria toxoid. C may be taken to represent an average London day school. In the course of ten years 40 per cent. of susceptibles will have acquired immunity by autovaccination, and by latent and evident infection. In the residential school B, which represents the result of an average three years at Greenwich Hospital School, double the number become immune in a third of the time required in C, but at a cost of one case for every three immunised. Column A is based on results of artificial active immunisation, and shows that a better result can be obtained in at least one-sixth of the time which was required in environment B, and without any accompanying diphtherial morbidity such as B and C produced. The continuous lines in the diagram represent the slow augmentation of natural herd immunity with time, in contrast with its rapid production by artificial means. The dotted lines indicate the gradual accumulation in the B and C samples of cases with a past history of diphtheria. The table in the centre of the diagram is a kind of balance sheet. The figures were estimated from the Greenwich data, and from figures given by Graham Forbes [13] in his report on the Prevention of Diphtheria. The efficiency index is merely an arbitrary number which is obtained on the debatable assumption that the value of an immunising agent varies directly as the percentage of immunes produced, and inversely as the time taken and the number of symptomatic infections which occur during that time.

Fig. 1 was introduced to show how a good man-made prophylactic excels nature in the rapidity of its action, and in its small cost to the community in pain, time, and money. Since we have evidence that the minor respiratory infections do cause, even if only a little, increase in herd immunity there is no reason why research and perseverance should not some day produce a prophylactic which would excel natural auto-vaccination in colds to the same extent as is the case in diphtheria, and when this millennium arrives the minor droplet infections should be almost as easy to prevent as diphtheria is now, when full use is made of modern methods. A good vaccine is, par excellence, the ideal method of increasing the resistance of the herd to droplet-borne infection. Methods which remove all bacteria from the environment depend on keeping the barrier between them and the herd inviolate. They are purely defensive methods against an enemy air force, who, if he should penetrate them, may find a people completely unversed in war at his mercy. An efficient vaccine, on the other hand, is an improvement on Nature's methods, whereby a short course of intensive training in the war against air-borne disease is given to the herd in order to enable it to destroy the enemy rather than run away from him.

Available Means of Combating Air-Borne Infection.

Until the perfect vaccine materialises it is necessary to use any other method which may be available to combat the prevalence of droplet-borne infections. Although bacteria cannot be prevented from polluting the air, yet if the average distance between the members of the herd can be sufficiently increased symptomatic infection will be considerably reduced; and provided that the individuals in a community are not allowed to receive too many, or too large, droplets, good may actually result by an increased resistance of the herd as a whole to the spread of infection. Moreover, if it is true that it often requires considerable time to collect a dose of infective material sufficiently large to initiate an illness, it becomes advisable to do all that is possible to increase the distance between individuals in those places where, of necessity, they remain for many hours in the same position relative to each other. Bed is the place where human beings remain stationary longest. For this very fact space

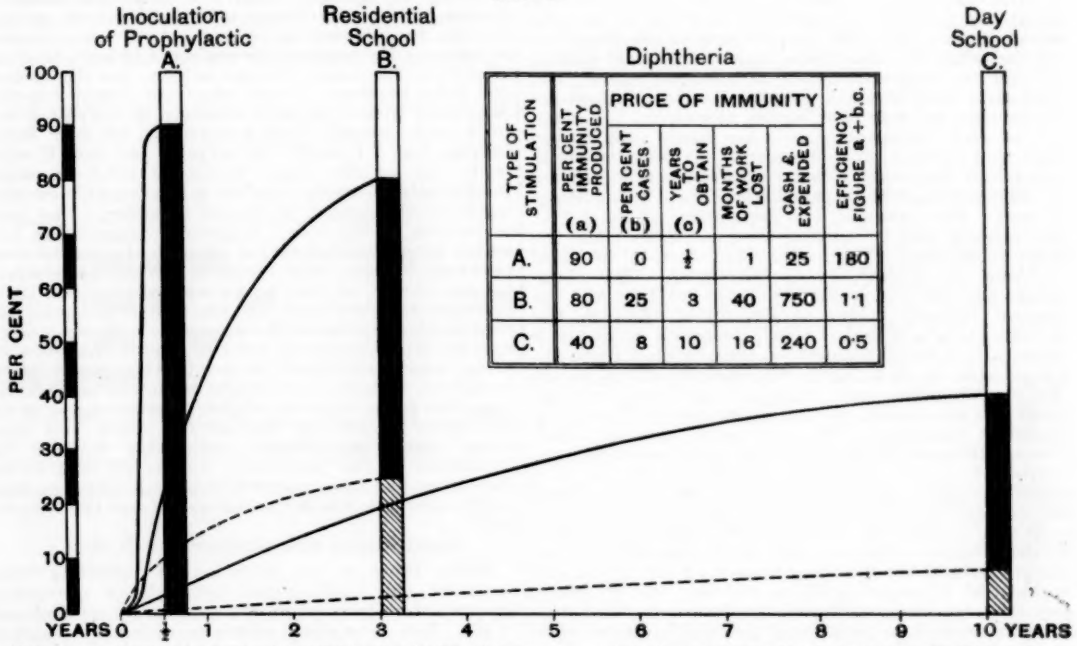
is more likely to be economised in sleeping quarters then elsewhere.

Common sense, without any knowledge of hygiene or bacteriology, would suggest that if you are not moving for eight or more hours, 2 ft. by 6 ft., just room to stretch out in, should be enough space for anybody, and if other members of your herd are sleeping with you, the closer you can get together the warmer you will be. This logic is applied so literally in winter in Northern China that the excessive overcrowding at night becomes a great help to the bacillus of pneumonic plague in its search for new hosts. The early hygienists recognised there was something wrong with this doctrine, and strongly urged the necessity for fresh air, in order to remove the CO_2 and mysterious noxious human exhalations. They undoubtedly did an immense amount of good, though drilled, ate, and played exactly as before, the only alteration in their mode of life was that they slept further apart. A caution is required against applying data derived from one kind of herd and race of bacteria to others. 2·5 ft. was sufficient to prevent meningitis in soldiers, but 3 ft. was insufficient to prevent the same disease in boys of more susceptible age in the naval training establishments.[11] Again, substitute small-pox for meningitis, and the beds would probably have to be put in different streets in order to prevent cross-infections.

Efficient Ventilation.

It is highly probable that diseases with a higher striking distance, such as chicken-pox, measles, and some types of the minor respiratory group, may be also propagated to an unknown extent by the more

FIG. 1.



TYPE OF STIMULATION	PER CENT IMMUNITY PRODUCED (a)	PRICE OF IMMUNITY: PER CENT CASES (b)	YEARS TO OBTAIN (c)	MONTHS OF WORK LOST	CASH £ EXPENDED	EFFICIENCY FIGURE a ÷ b.c.
A.	90	0	½	1	25	180
B.	80	25	3	40	750	1·1
C.	40	8	10	16	240	0·5

Diagram comparing natural and artificial stimulation of immunity. The columns represent 100 original susceptibles. The black areas show the percentage immunised, and the shaded areas the percentage notified as having contracted diphtheria.

their reasons for the necessity of a liberal supply of air are now known to be false.

The older researches on atmospheric vitiation resulted in the standards of space required to maintain health being given in cubic feet. I think anyone who has followed recent work will agree that cubic capacity per se is not nearly so important as the average linear distance between the respiratory orifices of the individuals who occupy any area. Linear distance is necessary in order to keep out of range of the heavy jets of infective droplets which may be expelled by the forcible expiratory efforts of a potential case or carrier of infection. To escape this heavy jet, beds should be as far apart as possible, and if four or more feet is insisted on between the edges of beds, the old standards of floor space and cubic capacity perforce have to follow. That increasing the space between beds will prevent infection is better illustrated by Glover's [14] original demonstration than by any other work. Epidemic meningitis was completely stamped out of soldiers' camps by merely increasing the distance between their beds from a foot or under to 2·5 ft. Droplets were still able to cross the wider gap, but in smaller doses, which still produced a few carriers but were unable to initiate an attack of meningitis. It is important to realise that the soldiers permanent travelling cloud of the smallest droplets as well as by the momentary but heavy short-range jet. Here we see the real necessity for efficient ventilation. A good flush of fresh air acts in two ways: first, it sweeps out the infected droplets, and, secondly, it prevents the humidity of the air being raised during the night by the water continually added to it from the lungs and skins of the sleepers. Other things being equal, the wetter the air the longer the droplets persist in it, which may be a clue to some of the effects of climate and weather on the incidence of disease. Just as space for health purposes means linear distance rather than cubic capacity, so also ventilation does not depend on the volume of space per se, but on the frequency of change of air. In the Royal Navy, by force of circumstances, linear space may be considered practically non-existent, and of necessity we are forced to rely almost solely on efficient ventilation. The following incident illustrates the meaning of efficient ventilation. In the small hours of a tropical night, during a gale, when all hatches were battened down, I visited a mess desk in a cruiser where 60 stokers, men of above the average physique, were sleeping in a space which ashore would have been considered only adequate for ten school-boys, yet the air was sweet and fresh in comparison to that in many

a fair-sized English bedroom which has been occupied for the night by an individual who fears the winter night air. The reason was that the total air on that stoker's mess deck was changed every two minutes; 100 cubic feet of space with the air changed 30 times an hour gives the same air-supply as the usual standard of 1000 cubic feet changed three times per hour. Although in the Royal Navy a microbe in its droplet has a very small gap to cross to get to its next host, yet it has to be very smart in doing so to escape being swept out through the exhausts into mid-ocean.

Environment by Night and by Day.

I have purposely stressed the spread of disease in sleeping quarters since there is no doubt, other things being equal, especially space, disease will spread easier there than elsewhere, because in sleeping quarters there is more time for droplets and water vapour to accumulate and more time for boys to collect adequate infective doses. Also mouth-breathing in sleep is common, resulting in snoring, which on one hand aids distribution of infection, and on the other, by short-circuiting of the nasal defence mechanism, makes reception of infection easier. But because I have stressed sleeping quarters it does not mean that no infection occurs elsewhere. If class-rooms and recreation spaces are damp and muggy they may become more dangerous environments than a spacious dormitory. Plenty of infection is contracted in day-schools, but in general less than in boarding-schools. For example, the population of the L.C.C. day-schools and Greenwich Hospital School are the same social class. The average age of an L.C.C. child is about 10 against 14 at Greenwich. The class-rooms and the playground are more spacious and the general hygiene better at Greenwich than in the average L.C.C. school. Also, Greenwich boys are a physically selected population, since most of them are expected to be fit to serve subsequently in the Royal Navy. Therefore age, physique, and day environment are all greatly to the advantage of Greenwich Hospital compared with the L.C.C schools. Yet during the years 1919 to 1927 the average diphtheria morbidity of the residential establishment was five times as great as the day-school morbidity (i.e., 450 compared with 83 per 10,000 per annum).

Watts [15] describes an epidemic of infantile paralysis in the schools of Broadstairs. An examination of his figures show if the schools are divided into (1) solely residential, (2) mixed boarding and day, and (3) solely day-schools, the residential produced 15, and the mixed schools 8, to each single case which was notified in the day-schools.

The magnitude of the differential morbidity for diphtheria and poliomyelitis in day- and boarding-schools strongly suggests that night environment is more important than day environment, and that the night environment in many residential schools must be most favourable for the spread of droplet-borne infection. Glover,[16] in an interesting paper on the spread of naso-pharyngeal infection (i.e., droplet infection) in schools, came to the same conclusion that in many public schools the dormitories were the favourite site of selection for bacterial dissemination. Dr. G. E. Friend,[17] in the subsequent discussion of this paper, stated that at his school he was certain that the dormitories were not the chief sites of infection. I confess the opinion of so experienced a school medical officer rather depressed me until I saw the plan of one of Dr. Friend's dormitories, when I felt very relieved because it supplied a piece of evidence I was in need of—namely, how much extra space is necessary to make a practical reduction in the incidence of droplet-borne diseases in sleeping quarters. With Dr. Friend's permission I have made (see Fig. 2) a copy of his bed plan of a dormitory where there was no evidence of bed to bed spread, in order to compare it with one, drawn to the same scale, where such evidence was overwhelming. Both rooms have adequate cross ventilation. The upper plan shows that a distance of 5 feet between the edges of adjacent beds is possible, which is double the space between the beds in the lower plan. Moreover, there are 126 beds in the latter in contrast to 24 in the upper plan. It is obvious that if infection is introduced into a room it will tend to be limited to the occupants of that room, hence the smaller the number per room the better, until the ideal is reached of one boy one bedroom. 126 is, in any case, too many eggs to have in one basket.

The upper plan as drawn shows the 24 beds are broken up into eight groups of three, with about 9 feet between groups. This scheme imitates eight separate rooms of three boys each, with less space between boys, in contrast to a possible arrangement making one dormitory for 24 boys with 5 feet between beds. The arrangement in groups is a compromise between the two principles of as few eggs per basket as possible, and as much space as possible per egg. Much careful observation would be needed to decide which method of spacing had the best effect on morbidity. Probably a complete spacing would be more efficacious in limiting the spread of some infections, and the grouped system for preventing others. As a mere guess I should say the grouped arrangement of beds as shown would be the more efficient scheme for diminishing the total incidence of all infections taken together, especially if each group is arranged to consist of boys of the same length of residence in the school.* Before leaving Fig. 2 I would like to point out that it represents one of the many pieces of evidence which incriminated sleeping quarters as a favourable environment for the spread of droplet infection. The black rectangles in the lower diagram represent the beds which were occupied by the victims of a scarlet fever outbreak. Notice that 12 out of 17 cases are confined to one corner of the room, and that these 12 all occupied adjacent beds, and the first 17 patients were confined to one-half of the dormitory. Hence it seems as if the 9-foot gangway, between the two halves of the room, was a sufficient barrier to the spread of the infection. Finally, a fortnight after the seventeenth case, two fresh cases of scarlet fever occurred in the previously uninfected half of the room, but these cases caused no others, conceivably because the occupants of the previously uninfected half of the dormitory had been vaccinated by sub-infective doses in the droplets which floated over from the infected half.

Suggestions for Reforms at Schools.

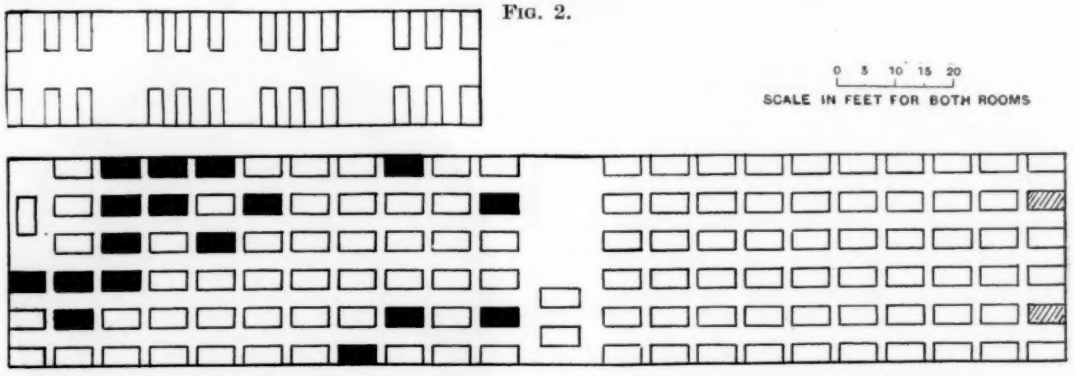
While there is no intention of belittling other methods, the fundamental principle in preventing droplet infection is linear space, aided by rapid change of air. But more space means more money, which in these days of economy is rarely forthcoming. However, the practical remedy is really so sensible, simple, and inexpensive that I am afraid no one will take it seriously. Most public schools have spacious grounds; why not let the boys sleep in them, and then use the old sleeping quarters to expand the class and recreation rooms? Cannot someone overcome the deeply rooted tradition of the average Englishman that he must sleep completely boxed in by four walls and a roof? If all boys slept in the open, in addition to a big drop in the incidence of all diseases there would be a marked increase in mental and physical agility.

In addition to the fundamental principle of as much space as possible, there are two other factors that can be made use of in combating air-borne infection. The first is, that since it may often take time to catch a disease, work periods should be short, with adequate intervals to fully flush out lungs and class-rooms with fresh air. Secondly, the recruits to a school have in general far less resistance to infection than the more senior boys. A superstition that men require more room than boys, and old boys more space than young boys, still lingers on from the days when a low CO_2 percentage was considered to be the chief essential of a healthy atmosphere. I suppose, if in any school there happened to be two groups of boys of equal numbers but different seniority, who were being

* Dr. Friend has informed me that this is done as far as possible. This, then, is another reason why his dormitories are unfavourable sites for bacterial dispersal.

allocated two dormitories of unequal size, the senior boys would be invariably given the more spacious room, which is wrong from the prevention of infection viewpoint. Again, in those schools which use both dormitories and single bedrooms, the latter, of course, are the perquisites of the more senior boys, though they must be more seasoned to their environment than the juniors. Of course, it is a reductio ad absurdum to give a new boy a suite of apartments and pile the whole upper sixth into one attic; but it might be feasible to use the available space to better advantage without necessarily increasing it, by evolving some scheme whereby the space allowed per boy would tend to increase from the top to the bottom of the school, instead of vice versa, as is usual at present. Anyhow, every attempt should be made to give more room to first and second term boys. For instance, at Greenwich Hospital School the incidence of diphtheria among first and second term boys was relatively five times as great as in the rest of the school (third to twelfth term boys). I honestly believe if only one could strike the right space gradient, both the morbidity and the ratio of symptomatic to symptom-

FIG. 2.



Diagrammatic representation of the arrangement of beds in two school dormitories. The upper one, in which there was no evidence of droplet infection, had a floor space of 60 sq. ft. per bed, the average distance between the edges of the beds being 5 ft. The lower, in which there was much evidence of droplet infection, had a floor space of 43 sq. ft. per bed, the average distance between the beds being 2·5 ft. The black rectangles show the beds occupied by scarlet fever cases between Oct. 18th and Nov. 13th, 1921, whilst the shaded rectangles show the beds in which the disease appeared between Nov. 21st and 24th.

less infection could be markedly decreased without having to provide any additional accommodation.

RISKS OF INTERFERING WITH NATURE.

I will conclude my paper with something in the nature of an anticlimax. Perhaps we are approaching, or have in some environments already reached, a condition of affairs where from a broad point of view it may be inadvisable to reduce droplet infection any further. There are many examples in economic biology of the danger of interfering with the balance of nature without careful calculation of the possible results. Elton [18] quotes an interesting example which is somewhat parallel to our problem. A sanctuary was made for the deer in Arizona, and the wolves and cougars, the natural enemies of the deer, were killed off. During the summer, in the absence of their natural enemies, the deer multiplied to such an extent that they would have consumed all their winter feed, and might have all starved before the following spring, if man had not stepped in and shot all but a sufficient number to maintain the species over the winter. As Elton tritely puts it: "The natural enemy of the individual deer was the real friend of the herd." In droplet infection two processes are continually at work, the production of illness which we wish to prevent, and increase of herd immunity which is to be encouraged, as it is a most useful asset in post-school life, and to the species as a whole. The trouble is, that just as the amount of disease is a function of the bacterial density, so is the amount of stimulated immunity; and in our present state of knowledge we cannot encourage the latter without increasing the former. Broadly speaking, under present conditions, even if many boys lose a few weeks' schooling from minor illnesses, as far as we know the vast majority suffer no permanent harm. The few that do contract a heart lesion, or other permanent disability, must be sacrificed if necessary for the benefit of the many. Preventive medicine deals with the herd, not the individual. Doctoring in general is such a personal matter, more especially in ships and schools than elsewhere, that it is hard to steel one's self to sacrifice individuals for an abstract benefit to the community.

In my own service I would be very loth, even if it was possible, to banish all droplet infection from the training establishments. It is there the young British sailor is made into a seasoned man, not so much by good food and physical training, but by adaptation to the bacterial environment in which he has to spend his future career. The epidemic of meningitis during the Great War is a good instance of the seasoning effect of the naval training depôts. Overcrowding is rightly considered a most important factor in the spread of cerebro-spinal meningitis, as Glover's work previously referred to definitely proved. Although the boys in training establishments often slept in beds as much as 3 feet apart, while the men in the fleet sleep in hammocks with not as many inches between them, yet the morbidity in the training establishments was 36 times greater than at sea, in spite of the great congestion in the ships on active service. The paradox, is, however, easy to explain. The crews of sea-going ships had all passed through the training depôts, where a few got meningitis, while the rest were rendered immune by inhaling droplets containing meningococci which were projected into the air by the hundreds of undiscovered carriers who were constantly present. In the Royal Navy our training establishments are our vaccinating centres, and if all bacteria were removed from their precincts the morbidity of infectious disease would be transferred to sea-going ships, maybe with disastrous results. Many incidents from naval history show how an infectious disease can decimate a ship's company, and many naval medical officers of to-day have had personal experience during the influenza epidemic of 1918 of what a malignant droplet-borne infection can do when let loose on the mess-decks of a battleship; it is therefore essential to the service to keep all the infectious disease we can on the beach. For use in the Royal Navy Elton's epigram might well be read as "Bacteria, the natural enemies of the sailor, are the real friends of the ship."

How far we might ever be able to strike the most advantageous balance between the enmity and friendship of bacteria is a great subject for future research

in the public health, school, and fighting services. Meanwhile it is important to note there is a very great difference between a service recruit and the majority of public school-boys. The first leaves his depôt to join a still denser population of men and droplets; it should therefore be part of his training to learn how to deal with infection. The public school-boy, on the other hand, will generally leave school for an environment which includes a single bedroom and is less crowded with men and microbes than that he has become adapted to during his school life. Moreover, in a densely populated country like England everybody comes in contact with many kinds of bacteria, and in general the longer clinical disease can be staved off the less severe it will be. Owing to a shorter average experience of bacteria, the fatality of infectious disease, other things being equal, is greater in the youngest two age-groups even when there is no difference in their respective morbidities. Such considerations, combined with an analysis of the few available statistics, make it certain that under present conditions much more good than harm will result to the vast majority of school-boys from any measures calculated to reduce the density of those microbes who prefer to travel from one host to the next in the respiratory droplets.

I would like to acknowledge my indebtedness to Surgeon-Captain P. May, whose most accurate note-taking, combined with his generosity in allowing me access to his cases and sick records, enabled me to collect much of the data on which this paper is founded.

REFERENCES.

1. Arnold, L. H., Ostrom, M. L., and Singer, C.: Proc. Soc. Exp. Biol., 1928, xxv., 624.
2. Dudley, S. F.: Med. Res. Council, Special Report Series No. 75, 1923.
3. Lereboullet, P., and P. and J.: Jour. Med. Franç., 1926, xv., 375.
4. Friedemann, U.: THE LANCET, August 4th, p. 211.
5. Copeman, S. Monckton: Proc. Roy. Soc. Med. (Epidem. Sect.), 1927, xx., 3.
6. Pockels, W.: Klin. Woch., 1927, vi., 2137.
7. Butler, W.: Proc. Roy. Soc. Med. (Epid. Sect.), 1913, vi., 120.
8. Halliday, J. L.: Med. Res. Council, Special Report Series No. 120, 1928.
9. Dudley, S. F.: Proc. Roy. Soc. Med. (War Sect.), 1921, xiv., 37.
10. Same author: Jour. of Hyg., 1927, xxvi., 132.
11. Same author: Med. Res. Council, Special Report Series No. 111, 1926.
12. Townsend, J. G., and Sydenstriken, E.: Reports of U.S. Public Health Service, 1927, xlii., 99.
13. Forbes, J. G.: Med. Res. Council, Special Report Series No. 115, 1927.
14. Glover, J. A.: Med. Res. Committee Official Report, March, 1918.
15. Watts, A. M.: Public Health, 1927, l., 114; and Brit. Med. Jour., 1927, i., 113.
16. Glover, J. A.: Proc. Roy. Soc. Med. (Epid. Section), 1928, xxi., 95.
17. Friend, G. E.: Ibid., discussion, p. 110.
18. Elton, C.: Animal Ecology, London, 1927.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 50 applications for grants were considered and £838 19*s.* 3*d.* was voted to 47 applicants. The following were some of the cases relieved:—

M.B., aged 75, following an operation had a cerebral hæmorrhage and has been bedridden for a year. His sister, who has acted as housekeeper, is entirely dependent on him. To make a livelihood some of the rooms in the house have been let and it is hoped this will bring in an income of £120 a year if the tenants remain. Voted £40 to help over the present time of difficulty.

L.R.C.P., aged 79, married, had to retire in 1922 owing to age, and lived on a small capital which is now exhausted. His wife took up work as a visiting nurse to make a living for both. Her earnings were the only income they had. The wife is now suffering from tuberculosis and is unable to support her husband. Voted £40.

Widow, aged 65, of L.R.C.P. Since the death of her husband in 1894 has worked as a companion. She now suffers from chronic bronchitis and renal trouble. Her only income is the old age pension of £26. Voted £30.

Widow, aged 59, of L.R.C.P. This is a case of complete destitution. She has struggled for an existence doing envelope addressing, but recently she has completely broken down in health, her eyesight is affected, and she is unable to do anything. Fund granted £36 and the Guild £26.

RADIOLOGICAL TREATMENT OF CUTANEOUS BASAL CELL CARCINOMA.

WITH RESULTING TISSUE CHANGES.

BY J. B. HIGGINS, M.B. MANCH.,
HON. RADIOLOGIST, SALFORD ROYAL HOSPITAL.

THE application of X rays has long been recognised as an effective method in the treatment of rodent ulcer. The consequent changes in the tumour cells and surrounding structures, however, is a branch of the subject which appears to have been neglected, and in the present work an attempt has been made to determine their nature. In order to obtain the clinical results of the method of treatment to be described, a series of 252 cases were examined.

In all cases, except where otherwise stated, the ulcer was first erased under 2 per cent. novocaine or procaine. The ulcer was anæsthetised at three or four points according to it's size, and the needle inserted immediately external to the raised edge. The patient was then allowed to rest for two or three minutes, after which the ulcer was erased with

FIG. 1.

Before treatment (× 200). T = tumour cells.

a Volkmann's spoon. The actual scraping was performed from the periphery to the centre, particular care being taken to remove all visible traces of the raised edge. Next the centre was well gouged to a depth sufficient to ensure the clearing of its base. By this means the greater part of the neoplasm was removed, though doubtless some malignant cells still remained. The patient was then placed on the X ray couch and prepared for treatment. In view of the comparatively large dose to be administered, it was essential that all parts other than those to be subjected to the rays should be carefully protected. It has been the custom to cover the face with a sheet of rubber impregnated with lead, out of which was cut a circular piece sufficiently large to leave a margin of about ¼ in. beyond the edges of the ulcer. The X ray tube was then placed at a distance of 8 in. between its anticathode and the skin. The dosage was one full Sabouraud pastille dose on each of three consecutive days to the site of the ulcer, and approximately ¼ in. of the surrounding skin. The tube used was the Coolidge type of X ray tube, and the apparatus a 16 in. X ray coil working at an equivalent spark gap of 6½ in. No filters were used.

Between January, 1923, and December, 1925, 364 cases were treated in the X ray department of the Manchester and Salford Hospital for Diseases

of the Skin, and of these 252—128 males and 124 females—were traced as having been referred to the X ray department. The average age of the patients was 58·5 years, while the youngest treated was a woman of 25, and the eldest a man of 87. Of these 252 cases, the results are as follows:—

Cures—		
Initial	170	201
Subsequent ..	31	(88·56 %)
Failures	23	(11·44 %)
Results unknown	28	

Of those cases which were cured, initial cures occurred in 84·57 per cent. and subsequent cures in 15·43 per cent. Under the heading of initial cures are included those cases which required not more than three consecutive pastille doses and one subsequent dose to accomplish the desired result, while "subsequent cures" include those which, though eventually cured, required additional dosage to that described under the initial heading. The largest dose required to produce subsequent cure was 3 consecutive doses and 6 single doses, the whole being spread over a period of four months. Twenty-two of the series were treated without previous erasion. Seven were cured with the initial dosage, 11 were cured subsequently, while 4 were failures. Of the subsequent

FIG. 2.

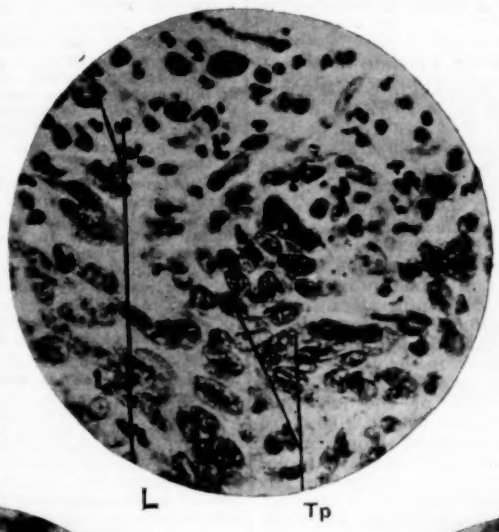


FIG. 3.

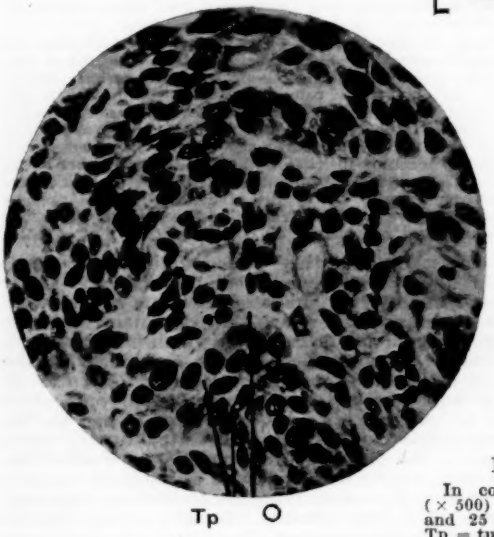
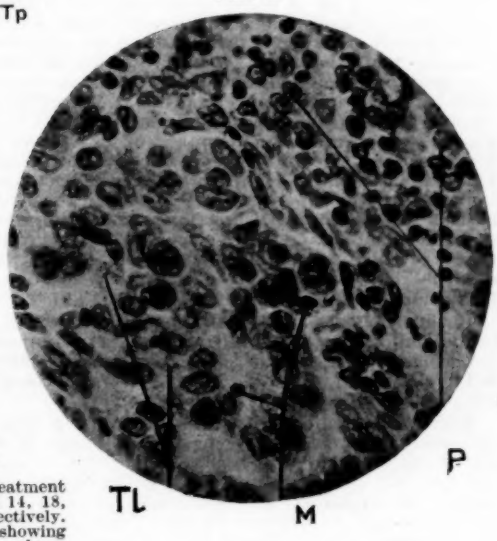


FIG. 4.



FIGS. 2–6.

In course of treatment (× 500) after 5, 10, 14, 18, and 25 days respectively. Tp = tumour cells showing pyknosis. Tl = ditto, showing lysis. O = intercellular œdema. M = mononuclear cells. P = plasma cells. Fb = fibroblasts. F = fibrous tissue.

FIG. 5.

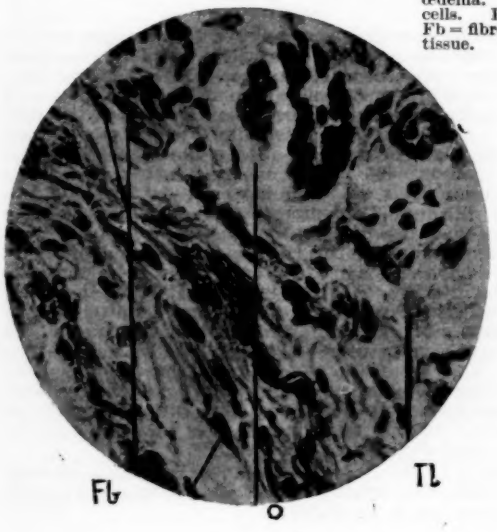
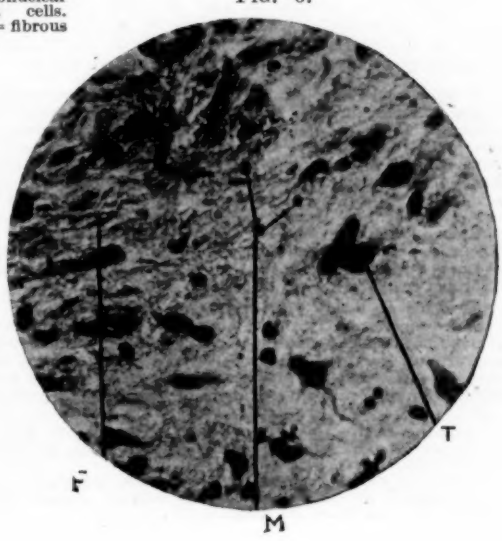


FIG. 6.



cures, one case required 23 single doses, two others 16 and 15 respectively, and a fourth 2 consecutive and 9 single doses.

Tissue Changes following Treatment.

Microscopical changes seen in the skin as the result of X ray erythema produced in the second degree reaction—i.e., as the result of three full pastille doses—appear to be closely allied with those associated with acute inflammation. Thus, in a section examined at the height of the reaction one would expect to find dilatation of the walls of the blood-vessels with swelling of the lining endothelium, thrombosis of the minute blood-vessels, transudation of lymph from the vessels, accompanied by migration of the leucocytes and lymphocytes, and other mononuclear cells (so-called small round cell infiltration), presumably derived from the proliferation of the cells of lymphoid origin. Of the actual change in human tissue cells in the acute stages of reaction, however, very little is known, although interesting studies of animal cells under the influence of the rays are available. Among the most recent works is that by H. A. Colwell and H. S. Thompson, who carried out a series of experiments on the skin of the tadpole. They irradiated the skin for varying periods through a depth of 1½ in. of water (equivalent to a filter of aluminium of approximately 3 mm.). Skin examined immediately after irradiation showed no appreciable changes, while between 24 and 48 hours afterwards the epidermal cells showed active division of nuclei with loss of definition of cell outline. The cytoplasm showed vacuolation, while numerous areas of hyperplasia were present. This mass of cytoplasm and nuclei showed signs of invading the corium. Eighty-four-hour specimens showed a marked increase of hyperplasia, but no degenerative changes were seen at this period, though the cells gave the impression of being smaller and less active. Seven-day specimens revealed a condition of complete atrophy of the epidermis with entire absence of cell formation.

It thus appears that irradiation of the skin of the tadpole under certain conditions results in temporary hyperplastic changes with increased nuclear activity, to be followed in the course of seven days by complete atrophy of the epidermis.

Mottram,[1] dealing with the action of β rays of radium (which correspond to the medium X rays and are identical in their action) on the cells of mouse sarcoma No. 180, found an early enlargement of the nuclei accompanied by abnormal mytosis. This he[2] attributes to increase in the hyaline material of the nucleus; and he found that normal tissue cells presented the same change.

In order to determine the changes occurring in the cells of rodent ulcer as a result of the treatment used in the cases previously described, the following microscopical examinations were carried out:—

A series of five sections were taken from different unerased ulcers at intervals of 5, 10, 14, 18, and 25 days respectively after the first day of treatment. In order to confirm the microscopic findings, five complete series, totalling 25 sections, were examined. In none of the sections was dilatation of blood-vessels actually detected, while no endothelial swelling and no thrombosis of minute vessels were found. The cell outlines were not defined and no vacuolation of the cytoplasm, as occurred in the experiments of Colwell and Thompson on the tadpole, was observed. The most striking changes appeared in the cell nuclei and the areolar tissue lying between the masses of tumour cells.

Five-day Sections.—Sections taken five days after the commencement of treatment showed a marked infiltration of polymorphonuclear leucocytes in the areolar tissue between and around the tumour cells. The former also showed signs of commencing œdema between the cell masses. The nuclei of the tumour cells showed signs of commencing pyknosis, or increase in the staining reaction of the chromatin granules within the nucleus.

Ten-day Sections.—The 10-day sections indicated an aggravation of the nuclear changes seen in the previous sections—namely, marked pyknosis. There were also definite changes in the contents of the areolar tissue. The number of polymorphonuclear leucocytes was markedly diminished, while an appreciable number of plasma cells had now appeared. Œdema of the areolar tissue was considerably more marked. At this period there was no appreciable lysis of the nuclei of the tumour cells.

Fourteen-day Sections.—These revealed the presence of a large number of plasma cells and other mononuclear cells, which had almost completely replaced the polymorphonuclear infiltration in the areolar tissue and intercellular spaces. The plasma cells were characterised by the cart-wheel arrangement of the granular deposits within the nuclei. Lysis of the nuclei of the tumour cells was now well marked, a large number showing signs of degeneration, as indicated by their relatively faint staining reaction, while the œdema had spread to the intercellular spaces.

Eighteen-day Sections.—These showed no marked changes in the areolar contents, though the intercellular œdema was still more pronounced. A large proportion of the nuclei of the tumour cells had now disappeared, while others were still undergoing lysis. At this period a new feature was noticed—namely, the appearance of fibroblasts in the intercellular spaces. Thus the action of the rays had evidently reached and probably just passed the point of greatest intensity, and we see the process of destruction and repair proceeding side by side.

Twenty-five-day Sections.—The intercellular œdema had apparently subsided. A number of fibroblasts and a considerable amount of fibrous tissue were present and, except in one case, very few tumour cells. A diminution in the number of plasma cells and mononuclear cells was also noted. This increase in fibroblasts and fibroblastic tissue was possibly due in part to their transformation from the plasma cells, which also accounts for the diminution in the number of the latter. The number of tumour cells present at this period varied according to the degree of destruction and appears to be dependent on the depth and to a lesser degree the extent of the unerased neoplasm.

Theoretically, at this period, all tumour cells should have disappeared completely, and their presence in these sections requires some explanation. It has been my experience that considerably larger dosage is required to cure ulcers which have not been previously erased. The sections examined in the present series come under this category and did, in fact, require more than the standard three consecutive doses to produce an eventual cure, owing to the greater tissue depth to be penetrated by the rays. In one of the sections examined 25 days after the three consecutive doses, a large number of tumour cells were still present, lying generally in groups and surrounded by fibroblastic cells and actual fibrous tissue. It seems evident that this case had been definitely underdosed.

Conclusions.

If we trace the progressive tissue changes seen in the respective groups of sections the following facts become apparent: (1) The early action of the rays on the skin structures is seen in the appearance of polymorphonuclear leucocytosis as early as the fifth day. (2) Progressive intercellular œdema occurs up to the eighteenth day. (3) Lysis of the nuclei of the tumour cells begins on the tenth day, with a maximum lysis on the fourteenth day. These two facts (2 and 3) demonstrate beyond reasonable doubt that three consecutive pastille doses of X rays, in their action on the tumour cells of rodent ulcer, reach their maximum intensity on or about the fourteenth day. (4) The process of repair, indicated by the appearance of fibroblasts, has definitely begun 18 days after the commencement of treatment. (5) The presence of tumour cells as late as the twenty-fifth day seems to prove that three consecutive doses on the unerased ulcer is not a sufficiently large dosage to ensure a certain cure without danger of relapse. In one case, indeed, the ulcer appears to have been definitely underdosed.

Owing to the impracticability of removing sections from definitely healed ulcers, none of the end-results of treatment is available.

[1] Mottram, J. C.: An Early Change in the Nucleus of the Cells of Tumours following Exposure to Beta Radiations, Brit. Jour. Radiol., 1927, xxxii., 61.

[2] Mottram, Scott, J. G., and Russ, S.: The Effects of Rays from Radium upon Division and Growth of Cancer Cells, Proc. Roy. Soc., Series B, 1926, c., 326.

EXERCISE TESTS IN PULMONARY TUBERCULOSIS.

BY ALEXANDER COOPER, M.B., CH.B. ABERD.,
ASSISTANT MEDICAL OFFICER, BROMPTON HOSPITAL SANATORIUM, FRIMLEY;
AND
DOROTHY DOW, M.B., CH.B. ABERD.

THE best way to obtain control of pulmonary tuberculosis is by rest. Once control has been obtained the object of treatment is to get the patient back to his previous occupation or to as useful a life as possible, without undue risk of a further breakdown. The great difficulty is to estimate how much physical exertion can be allowed with safety. All available criteria of improvement fail and we are driven to observing the response to carefully increased exercise. How far exercise should be pushed in testing out a man's fitness is a greatly debated question, but in a working-class sanatorium, where the aim for many is a return to a life of manual labour, it is essential to include manual work as a test. It is the practice at Frimley to start patients on graduated manual labour when they have satisfactorily completed a sufficient amount of walking exercise. It is frankly admitted that graduated labour involves more risk than walking exercise. In practice, however, it is found to have advantages which outweigh the added risk,[1] and available statistics[2] show that the after-results in patients treated by graduated labour are at least as good as when it is not employed. By instruction and supervision care is taken that patients only do exercise that they can manage comfortably. Their coöperation must be secured. Unless they are supervised some will take exercise too strenuously and some will slack. For walking exercise instruction is given that no one is to exceed a speed of half a mile in ten minutes, and as much longer as necessary is allowed to avoid discomfort, such as fatigue and dyspnœa. In doing work, mostly gardening but also handicrafts such as carpentry, boot-making, and painting, it is emphasised that no attempt is to be made to get a job done, but that the object is to obtain exercise which is easily within the patient's power. All exercise has to be carried out at an even rate; spurts and stops are to be avoided.

In estimating a patient's fitness for increased exercise several factors have to be considered: (1) symptoms—those volunteered and those secured by careful questioning; (2) temperature, pulse, and weight records; (3) type, condition, and extent of the lesion; and (4) general condition, physique, and occupation.

In addition to these, tests of the reaction of the pulse-rate to exercise will be a great help. Immediately on completing a given amount of exercise the temperature, pulse-rate, and respiration-rate are taken. The patient remains at rest, and the pulse-rate is taken five minutes later and again in half an hour. The temperature also is taken again in half an hour if it showed an initial rise.

To test the efficacy of such exercise tests we devised the following scheme. We took 100 consecutive cases who walked four miles morning and afternoon (men) and three miles (women), and classified them as satisfactory or unsatisfactory cases. We then compared the exercise tests of these two groups. That level of exercise was taken as the standard, because to reach it patients had to be in a fairly stable condition, and because by then they were more accustomed to tests. Hence the tests should be more reliable. The division into satisfactory and unsatisfactory cases was made from the information available within a few days of their admission to the sanatorium. Thus we had a comprehensive history, X ray and physical sign findings, notes on symptoms and general condition, and the result of sputum examinations. Cases likely to respond well to treatment and in whom the ultimate prognosis seemed good we classed as satisfactory; the others as unsatisfactory. Of the 100 consecutive cases 40 were grouped as satisfactory and 60 as unsatisfactory. The exercise tests were classified as good, intermediate, and bad.

Good.—The pulse-rate falls to within ten beats of the resting pulse-rate within five minutes of stopping exercise. No rise of temperature. No dyspnœa. The following is an example:

Initial pulse-rate	88	Pulse in 5 minutes ..	76
Respiration	18	Resting pulse	70
Temperature	98·2		

Intermediate.—The pulse-rate falls to within ten beats of the resting pulse-rate within half an hour of stopping exercise. No rise of temperature. No marked dyspnœa. Example:

Initial pulse-rate	94	Pulse in—	
Respiration	20	5 minutes	88
Temperature	98·4	30 minutes	76
		Resting pulse	70

Bad.—The pulse-rate does not fall to within ten beats of the resting pulse-rate within half an hour. There may be a rise of temperature and dyspnœa. Example:

Initial pulse-rate	110	Pulse in—	
Respiration	24	5 minutes.. ..	100
Temperature	98·6	30 minutes	88
		Resting pulse	70

The initial pulse-rate is disregarded in the classification. Observation of a great number of cases showed that very few did not show an initial rise of pulse-rate.

In the satisfactory cases the exercise test results were:—

Good .. 13 (32½%). Intermediate .. 25 (62½%). Bad .. 2 (5%).

In the unsatisfactory cases the exercise tests were:

Good..11 (18⅓%). Intermediate..19 (31⅔%). Bad..30 (50%).

This clearly indicates the value of these exercise tests, when classified in this way, because among satisfactory cases there were only 5 per cent. of bad tests, as against 50 per cent. among the unsatisfactory. Among the satisfactory cases those who did intermediate or bad tests could be more closely watched and their exercise more gradually increased. Those in the unsatisfactory group whose tests were good might have their exercise increased with safety.

We decided to try another method of estimating the efficiency of exercise tests. We consider that patients with normal temperatures are unlikely to be toxæmic, and therefore they should do satisfactory tests. A normal temperature was strictly judged. For instance, a swing of more than 1½°, a subnormal temperature, and a temperature with an occasional spike to even 98·8° were all excluded. In 50 consecutive cases with normal temperature charts the exercise tests results were:

Good .. 19 (38%). Intermediate .. 26 (52%). Bad .. 5 (10%)

Thus the tests are again found reliable.

Examples of Tests.

1. *Very Good Tests.*—These were done by patients in a stable condition, who were making excellent progress (Table I.).

TABLE I.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
(*a*) 4 miles walking, A.M. and P.M. ..	78	18	98	78	76	70
(*b*) Grade 4 (heavy work)	76	18	98·2	74	74	70

I.P. = Initial pulse-rate; R = respiration; T = temperature.

[1] Wingfield, R. C.: Modern Methods in the Diagnosis and Treatment of Pulmonary Tuberculosis.

[2] Medical Research Council, Special Report Series, No. 33 and No. 85.

2. Improvement in tests with increasing exercise concurrent with general improvement (Table II.).

TABLE II.

Test.	A. I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	B. I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
1 mile walking, A.M. and P.M.	108	20	97	96	88	116	24	98	110	100
4 miles ditto ..	90	18	96	84	88	100	20	98·4	92	84
Grade 1 (light work)	82	18	97·6	86	84	90	20	97·6	90	86
Grade 4 (heavy work)	78	18	98·4	80	78	78	16	97·8	76	—

In the early stages of exercise more latitude must be allowed in estimating the exercise tests. As a result of bed treatment, the muscle tone is poor and the heart is unaccustomed to the strain of exercise, and in consequence a non-toxæmic tachycardia often occurs. This tachycardia disappears as the muscles and heart muscle become attuned to exercise.

3. Tests showing a toxæmic condition (Table III.).

TABLE III.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
1 mile	112	20	98·6	100	100	80
2 miles	128	18	98·2	102	100	80
3 ,, ...	132	22	97·6	114	94	80
3½ ,, ...	116	24	98·4	112	100	80

All the evidence in this case, excepting that of the tests, indicated improvement. A severe breakdown occurred when the patient reached the stage of the last test. Compare these tests with those in group 2, where the tests improved with the patient's general improvement.

4. Tests influenced by a mechanical factor (Table IV.).

TABLE IV.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
(*a*) 2 miles ..	120	22	98·4	100	80	80
(*b*) 4 miles ..	124	24	97·6	110	88	84

(*a*) A case of marked right-sided fibrosis with the heart displaced to the right.

(*b*) A case of fibrosis and cavitation of left lung with heart displaced to the left.

In the last two exercise tests it will be observed that the initial pulse-rate is high, that there is a definite fall in five minutes and a return to almost resting pulse-level in half an hour. This type of test is typical of a fair number of cases in which there is much fibrosis and heart displacement, or in which there is extensive disease, so that the heart has to contend with mechanical difficulties. Many such patients, however, do normal tests.

TABLE V.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
(*a*) 2 miles ..	122	20	98·2	120	108	80
(*b*) 4 miles ..	106	24	97·8	98	96	80

When, in addition to the mechanical factor, there is also a toxæmic one the pulse-rate does not come down in half an hour to the resting pulse-rate level (Table V.).

When the difficulty is purely mechanical, slowly and carefully increased exercise will often secure a fall in the high initial pulse-rate (Table VI.).

TABLE VI.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
Walking A.M. and P.M.—					
1½ miles	128	20	98·2	110	88
3 ,, ...	122	20	98·8	100	78
4 ,, ...	100	20	98·4	90	80
Grade 1	96	18	98·6	80	78
,, 2	78	16	98·4	76	76
,, 3	86	20	98·6	88	76
,, 4	84	18	98·2	80	76

Unreliability of Tests.

Rarely the results suggested improvement, although the disease was progressing (Table VII.).

TABLE VII.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
Walking A.M. and P.M.—					
2 miles	104	20	96	100	98
4 ,, ...	100	24	96·8	96	88
Grade 3	86	20	97	80	80

A patient who was fit and had no evidence of pulmonary tuberculosis gave the result shown in Table VIII.

TABLE VIII.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
1 mile walking A.M. and P.M.	110	20	97	100	92	70
Grade 2	106	20	98	98	90	70

A patient with slight disease but no toxæmia showed a tachycardia due to excitement. Repeated tests usually overcome this difficulty, but sometimes the tests have to be abandoned (Table IX.).

TABLE IX.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
1 mile walking A.M. and P.M.	156	24	97	138	124
Grade 2	130	18	98	128	120

These are gross examples of unreliability in the results. Slighter degrees of unreliability are fairly frequent and have to be watched for. People accustomed to doing heavy work will usually do better exercise tests than sedentary workers. The age of the patient is important. In hot weather and high winds tests are less reliable.

Artificial Pneumothorax Cases.

The same general principles apply. A patient with a completely collapsed lung can produce excellent tests, but the mechanical factor gains prominence in pneumothorax cases, and then tests are very helpful. For example, where heart and mediastinal displacement have occurred a good result proves that any mechanical difficulty has been overcome. Again, where the character of an exercise test suggests that a mechanical factor is at work a reduction of pressure to correct the mediastinal displacement can be tried.

In the hands of those accustomed to using them these exercise tests have been of great help in controlling the treatment of patients under sanatorium conditions. We hope that this paper has sufficiently indicated their usefulness to interest others who have not yet given them a trial.

THE INCIDENCE OF TRAUMATIC EPILEPSY AFTER GUNSHOT WOUND OF THE HEAD.*

By W. W. WAGSTAFFE, F.R.C.S. Eng.,
HON. SURGEON, RADCLIFFE INFIRMARY, OXFORD.

THERE seems to be extremely little information on the type of case which develops traumatic epilepsy and the frequency of incidence, and it is with the object of clearing up these points that this paper is written. The following are the only references that I have been able to find which deal at all with the statistics of the problem. P. Sargent[1] states that up to the end of the year 1920 the Ministry of Pensions had traced 18,000 cases of gunshot wound of the head, of whom nearly 800 (or 4½ per cent.) were subject to epileptic fits. Bathe Rawling[2] traced 425 cases of gunshot wound of the head by circularising. Of these, approximately 25 per cent. report that they are suffering from fits, but their statements are unsupported by any examination. W. Aldren Turner[3] quotes Allen's statement of the frequency of onset of traumatic epilepsy after the Franco-Prussian war, when 571 cases of gunshot wound of the head were reported with 25 cases of traumatic epilepsy. An extensive search of the French, German, and American literature has failed to bring to light any other statistical statement. G. Voss[4] refers to a series of his cases, 34 per cent. of whom developed epilepsy, but the cases which came under his care were specially selected as mentally unstable cases of gunshot wound of the head.

The cases in this series came under my care in France during the years 1916–1918. During the greater part of that time a special hospital was open at St. Omer for treatment of cases of gunshot wound of the head from the First Army area. These cases were sent direct to the hospital from the casualty clearing stations for the most part without operation, and were operated on by me at No. 7 General Hospital. I have full notes of their conditions. A certain number of cases are also included upon whom I operated in casualty clearing stations during 1918.

The total number of cases is 820. Of those traced there were alive, 340; dead, 245=585. Of the 245 dead, 208 died in France within two months of being wounded. The majority of cases were kept in hospital in France under my observation for two months or less, and a few cases longer, until their condition was regarded as completely stable.

The cases considered here have been followed up by examination of the Ministry of Pensions records. They have been brought up to date in the course of the last year, and represent a history of the patients' careers up to 11 years from the time at which they were wounded. It is thought that this series of representative unselected cases of gunshot wound of the head, which includes the majority of cases from the First Army area over the period it covers, may give a valuable indication of the frequency of onset of certain types of epilepsy in this class of case. Investigation is, of course, limited by the fact that it has been impossible to interview these patients personally, and the particulars of complications vary enormously in the different reports.

Analysis of the Series.

In analysing the series we are especially considering the 340 cases who are still alive and the 37 who died after their return to England, for it is obvious that the cases who died shortly after being wounded are irrelevant.

The total number of cases who show definite traumatic epilepsy, as established to the satisfaction of the Ministry of Pensions, is as follows: Alive, 31; dead, 6=37. In addition to these, there were 23 alive and 5 dead, who complained of fits, but since the medical boards did not establish them as true traumatic epilepsy they have, therefore, been omitted.

The following table gives the number and type of the cases traced who are still alive, and the number of cases of traumatic epilepsy classified according to the type of gunshot wound of the head:—

—	Traced.	Fits.
Penetrating dura.		
Alive	155	28
Dead	21 (13·5%)	5 (17·8%)
Total	176	33 (18·7%)
Fractured skull: dura not penetrated.		
Alive	117	2
Dead	7	—
Total	124	2
Scalp wound only.		
Alive	56	1
Dead	4	1
Total	60	2
Concussion and fractured base: no wound of head.		
Alive	12	—
Dead	5	—
Total	17	—
	377	37 (9·8%)

The vast majority of cases of traumatic epilepsy are, therefore, cases in which there have been penetrating wounds of the head, and the percentage of traumatic epilepsy in these is as high as 18. In all the rest the incidence is only 2 per cent., and the incidence in the whole series is just under 10 per cent. It is justifiable to conclude that the incidence of traumatic epilepsy is definitely associated with the severity of the primary wound.

Other Factors Controlling the Incidence of Traumatic Epilepsy.

Situation.—In this series there were (penetrating):

Frontal	10 (5 dead)	Temporal	2
Parietal	10	Occipital-parietal	4
Fronto-parietal	4	Occipital	3

Four non-penetrating wounds: 3 parietal; 1 temporal (dead).

The wounds are fairly evenly distributed all over the scalp, except that there is rather a preponderance of parietal wounds.

Severity of Complications.—All the five cases of injury in the frontal region which are still alive show marked mental deterioration. Most of the cases of parietal injury, and the three cases of occipital injury, show marked organic lesions. In the latter a foreign body has traversed the greater part of the cerebrum and is lying in the frontal region, causing a marked paralytic lesion.

So that of the 28 cases which are alive, 21 have severe complications. Of 155 cases of penetrating wounds 59 show severe organic complications, while 96 show no severe complications. Of the 59 with organic complications, 16 (27 per cent.) have fits. Of the 96 with no organic complications 12—i.e., 12·5 per cent.—have fits. It is obvious, therefore, that fits are more common in cases which have severe organic lesions.

Time of Onset of Fits.—In many cases the patients had complained of fits for some years before these were definitely established and certified by a doctor and accepted by the medical board. One must take

* A paper read before the Society of British Neurological Surgeons at their meeting in Edinburgh, June, 1928.

[1] Brain, 1921, xliv., 312.
[2] Brit. Jour. Surg., 1922–23, x., 93.
[3] Jour. Neur. and Psychopath., 1923, iii., 309.
[4] Münch. med. Woch., 1921, lxviii., 258.

it that the original complaints were quite genuine. In many cases there is a definite history that the attacks increase in severity as time goes on. The time of onset of the fits is therefore taken as the time of the first complaint. The earliest was approximately two months from the time of injury, and the latest was seven and a half years, the average being two years and one month. This observation is interesting in view of the fact that traumatic epilepsy is generally believed to develop within a few months of the injury. Many cases are well known in which the time of onset of the epilepsy has been even more than seven and a half years from the time of wounding.

Association with Early Fits.—It has been usually stated that early fits are of no importance in the prognosis of traumatic epilepsy, but among the 37 cases of traumatic epilepsy five had had fits in the early stages—that is to say, within a few days of the onset. These early fits are of the true Jacksonian type and soon disappear, and the patient is entirely clear of fits for a period of years or months. Among the cases that we have traced so far only seven others had early fits which gives a very high percentage—approximately 13·5—of early fits in cases of traumatic epilepsy and approximately 2 per cent. in the rest. The number of early fits observed in the cases traced (12) is too small for definite conclusions to be drawn, but it is suggestive.

Association with Foreign Body in Brain.—Of the 33 cases of penetrating wounds of the head which developed fits, 12, or 36 per cent., showed a foreign body in the brain. Of the remaining 143 cases traced up to date, 35 (25 per cent.) showed a foreign body in the brain. These figures again bear out the general conclusion that the more severe wound is more likely to cause fits.

Mortality.—The onset of fits has no marked effect on the mortality. Of the 37 cases with fits six have died. Five had penetrating wounds and one a scalp wound. The latter died of status epilepticus two months after being wounded. One of the former died of influenza two and a half years after being wounded; two died as a result of fits, one of meningitis, and one committed suicide. Six deaths in 37 cases gives a mortality of 16·2 per cent., whereas all the cases of gunshot wound of the head traced up to date—377 in all—show 37 deaths after returning to England—i.e., over the same period as the traumatic epilepsy patients—a mortality of 9·8 per cent. There is not sufficient difference in the mortality to justify any conclusions.

Conclusions.

Taking the series as a whole, we must divide the cases of traumatic epilepsy into two classes: (1) cases of slight injury—i.e., scalp wounds and non-penetrating fractures; (2) cases of severe injury with gross cerebral destruction and laceration.

I am inclined to think that the cases with scalp wounds would in all probability have developed epilepsy apart from any organic injury to the head. Both scalp wound cases which developed epilepsy did so very soon after the wound, and I cannot help thinking that they come under a different category from those of gross destruction. Undoubtedly the most common cause of traumatic epilepsy is a severe destruction of the brain substance which is, of course, always associated with sepsis; presumably this is a factor in the production of epilepsy.

The definite facts brought out by this investigation are:—

1. Traumatic epilepsy is nearly ten times more common with penetrating wounds of the dura than with other injuries to the head.

2. The site of the wound has no influence on the onset of traumatic epilepsy.

3. Traumatic epilepsy is more than twice as common in cases of penetrating wounds of the dura which show severe organic lesions than in those which do not.

4. Traumatic epilepsy may come on at almost any time after a gunshot wound of the head. In this series the variation is from two months to seven and a half years.

5. Traumatic epilepsy appears to be much more common in those cases which show transient Jacksonian fits within a few days of the injury.

6. Traumatic epilepsy is somewhat more common in those cases where a metallic fragment remains in the brain.

7. The mortality in cases which have developed traumatic epilepsy is rather higher than in other cases of gunshot wounds of the head.

In conclusion, I would like to express my gratitude to Sir Cuthbert Wallace for his assistance and encouragement throughout the whole course of this investigation; to Sir Walter Morley Fletcher for allowing me all the facilities at the disposal of the Medical Research Council in order to trace these cases; and to the many officials of the Ministry of Pensions who have so courteously provided me with the materials for this research.

Clinical and Laboratory Notes.

A CASE OF TRUE DIABETES MELLITUS COMPLICATED BY PREGNANCY.

BY N. M. GOODMAN, M.B. CAMB.

THE striking alteration in prognosis since the introduction of insulin therapy is well illustrated in the following account of a rare complication of true diabetes—viz., pregnancy.

An unmarried domestic servant, aged 26, was first seen on Oct. 24th, 1927. She complained of great thirst, beginning four weeks previously, and also of lassitude and wasting. The urine was found to be loaded with sugar; acetone was also present. On Oct. 28th she was admitted to the Lymington Cottage Hospital and put on Allen's diet. Her weight on admission was 6 st. 13 lb. After three days on a fat-free diet, 48 hours' starvation was required to render the urine sugar-free. She remained three weeks in hospital, during which time she gained 7 lb.

She was sent out on a diet representing 25 calories per kilogramme of body-weight—i.e., 7 lines (omitting bread) on the line ration scheme (R. D. Lawrence). Any increase resulted in sugar appearing in the urine. While in hospital she was taught how to do her own Fehling's tests. Insulin treatment was refused. After discharge she probably exceeded the diet, and though her weight and general condition remained stationary, sugar was constantly present in the urine in varying amounts.

In February, 1928, her relatives discovered, and she admitted, that she was pregnant. The last period ended on Oct. 21st, but she had lost blood in what was taken to be a normal period while in hospital. Conception had presumably taken place just before her admission. On examination she was found to be four months pregnant.

Insulin was now insisted upon, and the patient was taught to administer it herself, at first under the supervision of the district nurse. As she lived quite out of reach of immediate medical assistance, insulin dosage was not pushed rapidly up. She began on 7 units twice daily, and the diet was increased to give 35 calories per kilogramme of body-weight. Dosage was gradually increased, but it was not until seven weeks had passed that the urine was consistently sugar-free, the dose being then 25 units twice daily. Pregnancy was wholly uneventful, and on June 25th she was readmitted to the Cottage Hospital. On June 28th Cæsarean section under spinal anæsthesia was successfully performed by my partner, Mr. R. M. de Mowbray, and the mother was sterilised by resection of a portion of the Fallopian tubes. A healthy boy weighing 8½ lb. was delivered. No change in the diet or insulin dosage was made before, during, or after operation, nor was extra carbohydrate given.

On June 30th (two days after operation) some signs of hypoglycæmia (faintness and rapid pulse-rate) appeared, and insulin was reduced to 20 units twice

daily.[1] This was found to be insufficient to keep the urine sugar-free, so on July 6th the dose was raised to 23 units. The puerperium was uneventful, and mother and child are now quite flourishing. Since discharge she has exceeded her diet and gives herself 25 units twice daily to correct it; on this dose the urine is usually sugar-free.

A point worthy of note was the entire absence of "alarums and excursions," although she was a not too intelligent patient, living four miles from medical assistance, and also in spite of the impossibility of control by blood-sugar estimations, which were entirely omitted.

A CASE OF TRAUMATIC RUPTURE OF THE SPLEEN IN AN ELDERLY MAN.

By L. DIGBY NELSON, M.B., B.S. DURH.,
HOUSE SURGEON, ROYAL INFIRMARY, SUNDERLAND.

THE following case of traumatic rupture of the spleen in a man aged 61 appears to be of interest.

The man was admitted to the Royal Infirmary, Sunderland, at 5.30 P.M. on July 23rd, 1928, complaining of injuries sustained on being thrown against a wall by a cow at 9.30 A.M. on the same day. He complained of pain on the left side of the thorax and down the left side of his abdomen to the iliac crest. Fracture of the eight and ninth ribs was diagnosed and treated. The abdomen showed no bruising, no distension, and there were no signs of any internal injury. There was no free fluid. He passed normal urine without difficulty, and his general condition was good until 10.30 P.M., when the pulse-rate began to rise and at the end of an hour was 120. His respirations had become deepened, but not definitely sighing. He was blanched and restless. He complained of diffuse pain and tenderness in the left side of his abdomen, most marked over the splenic area, and there was now dullness in both flanks, extending medially to the mid-clavicular line.

The provisional diagnosis of ruptured spleen was made, and at 12 P.M. Dr. G. S. Robinson, assistant honorary surgeon, made a small exploratory mid-line incision in the upper abdomen; free blood gushed out. A second incision was then made from the mid-line in front, parallel with the left costal margin, as far as the anterior axillary line. On palpation the spleen was felt to be twice its normal size and fluctuation was detected on the costal surface. After draining off the free blood the spleen was drawn into the wound as far as possible. The capsule was seen to be lifted off the organ and ruptured anteriorly. Splenectomy was performed, the pedicle being held between the index and middle finger of the left hand, exposing a small tear in the organ near the hilum anteriorly. No. 3 chromic catgut was used to ligate the pedicle and the abdomen was closed in layers. The patient was sent back to the ward somewhat collapsed. Rectal salines and hypodermic injections of pituitary, ½ c.cm., were given four-hourly and next morning the collapse had passed.

The spleen was found to have two injuries; a small tear near the hilum anteriorly and a rupture in the organ itself on the costal surface above the notch. The blood had stripped the capsule off the organ for a considerable extent, but had not clotted.

Recovery was rapid. Three days after operation the temperature rose to 100° and there was pain at the site of fracture of the ribs. Firm strapping relieved the pain and the temperature fell to normal. The wound healed by first intention. A blood examination taken on August 15th, 1928, gave the following figures: hæmoglobin, 80 per cent.; red blood cells, 4,630,000 per c.mm.; white blood cells, 18,200 per c.mm.; colour-index, 0·87. *Differential white cell count:* polymorphonuclears, 62 per cent.; eosinophils, 1 per cent.; lymphocytes, 25 per cent.; basophils, 0; large mononuclears, 12 per cent.

The mechanism of the injury must have been as follows: The man fell on his left side and fractured his ribs, at the same time crushing the spleen and causing rupture of the organ under the capsule. Hæmorrhage took place between the organ and capsule until the tension overcame the resistance which the capsule offered, the rupturing of the capsule and the consequent hæmorrhage giving rise to the sudden collapse and signs of free fluid.

[1] See C. G. Lambie: THE LANCET, 1927, i., 22.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Oct. 22nd the chair was taken by Dr. WALTER CARR, and a discussion on the

DIAGNOSIS AND TREATMENT OF EMPYEMA

was opened by Dr. C. E. LAKIN, who distinguished a synpneumonic type occurring simultaneously with pneumonia consolidation and a much commoner metapneumonic type—arising as a sequel of the pneumonic process. The former was almost confined to children under two and was revealed by grave illness, dyspnœa, high fever, cyanosis, and flat percussion note at the base with ægophony or skodaic resonance over the upper part of the lung and heterolateral displacement of the apex beat. In all kinds of empyema loud tubular breathing might be heard. Metapneumonic empyema might go unrecognised when the mother gave no clear history of pneumonia and the child lost weight, refused food, became very pale, and sweated profusely. There might be little fever or dyspnœa, and the child might die before the cause of the toxæmia was discovered. Even a leucocytosis might be absent and only examination of the chest reveal the trouble.

The commonest organism next to the pneumococcus was the streptococcus, which was a more serious invader because the effusion it produced was poor in fibrin, and so adhesions did not form to limit the spread of pus. It was highly important to distinguish a diffuse from a circumscribed empyema, for opening the former might be disastrous. X ray examination might be misleading, although lateral projection and the Potter-Bucky diaphragm had improved the results. Where it failed, estimation of the pleural tension was helpful. Localised empyemata were classified according to position into: (1) encysted empyemata of the general pleural cavity, lying between the costal and visceral pleura; (2) basal, between the base of the lung and the diaphragm; (3) apical; (4) interlobar; and (5) mediastinal, between the mesial aspect of the lung and the mediastinum.

Physical Signs.

Local œdema over the chest was almost pathognomonic of empyema, but was not often seen. Tenderness on deep pressure suggested a purulent effusion, and friction was not often heard above the level of an established purulent effusion. About 10 ounces of fluid were required to displace the heart appreciably, unless the smaller quantity lay between the lung and the mediastinum. A history of intermittent temperature, setting in after the crisis of a pneumonia had passed, was very suggestive, but high fever, chills, and sweats might occur in serous effusions. In puzzling cases radiography should precede the use of an exploratory needle, which was the final test. All the recognised signs of pleural effusion might occur in other conditions; suppuration within or below the lung was most likely to cause difficulty in diagnosis.

Treatment.

The post-war epidemic of influenza had shown how bad were the results of immediate evacuation and drainage of the pleura. The substitution of aspiration for thoracotomy had immediately improved the mortality-rate. Irrigation might cause sudden death or convulsions. Early diagnosis was essential, and must be based on a correlation of the physical signs, radiological examination, and bacteriological findings. Offensive puncture fluid usually meant the presence of a long thin saprophytic bacillus from the respiratory or alimentary tract, betraying some communication between the pleura and the lung or abdominal viscera. For these cases immediate drainage was essential. When the fluid was non-offensive but

purulent the treatment depended on the condition of the lung. If active pneumonia was in progress thoracotomy would be catastrophic, and dyspnœa should be relieved by daily aspiration and careful nursing until the pulmonary lesions retrogressed. Delay was rarely necessary for more than a few days, so that the risk of permanent harm from fibrosis was small. When operation was possible, local anæsthesia was preferable, as it caused less shock and pulmonary irritation. To encourage approximation of the walls of the empyema cavity the patient should get up as soon as possible and should sit up during the day, and respiratory exercises and a Woulfe's bottle should be instituted early.

Mr. TUDOR EDWARDS, dealing with the

Surgical Aspect of Empyema,

said that the term empyema should be limited to the localised type, using the word "pyothorax" for the generalised form. Radiography was a most valuable aid to diagnosis, and should never be neglected. It enabled one to visualise the intrathoracic conditions and drain at the best site. Sometimes X rays did not distinguish between thickened pleura and empyema. Normally peripheral empyema showed a dense shadow towards the lung, extending upwards to the axilla; in the apical type the shadow was more globular and well defined, rarely showing displacement of the mediastinal structures. True interlobar empyema was distinctive; a broad band of opacity marked out the interlobar fissure. Diaphragmatic empyemata showed an increase upwards of the liver shadow on the right side, while mediastinal empyema generally appeared as a broadening of the mediastinal shadow with displacement of the heart or great vessels. Exploration with needle and syringe was the most important diagnostic aid, but precautions were necessary. It should always be done under local anæsthesia to avoid pleural shock. Neoplasms occasionally simulated empyema, but a large polymorphonuclear leucocytosis indicated the latter.

Treatment must never be an emergency. Rib resection under local anæsthesia should be performed as soon as sufficient adhesion was present; this was usually indicated by thick pus. The wound should be repacked with gauze every three days; the granulation tissue which formed prevented extension of infection. If the wound had not healed in six weeks tuberculosis or neoplasm should be suspected. Fatalities from irrigation were due to using a small tube in a small cavity, producing sudden increase in pressure. The chlorine group were the disinfectants of choice for decorticating agents. Bad results of operation were chiefly due to late diagnosis or inadequate treatment. Interlobar empyemata called for much the same treatment as pulmonary abscess. They might be drained in one stage when they were near enough to the surface to produce adhesions. Some tuberculous empyemata would clear up with aspiration and gas replacement; they should never be drained unless secondary pyogenic infection was spreading.

Chronic empyema might result from delayed diagnosis. These collections of pus might drain into the lung so slowly that patients were not laid up. Clubbing of the fingers was always marked, but the only means of distinguishing between thickened pleura with and without empyema was aspiration. Lipiodol was useful in diagnosis; it should always be injected through the smallest catheter possible.

Dr. F. J. POYNTON described research on empyema in children at Great Ormond-street. The mortality in infancy had been 76 per cent. one year and 55 the next, due mainly to shock and septic poisoning from open incision and drainage, while the dressings inflicted great suffering on nervous children. Out of 22 cases treated by the apparatus for continuous aspiration six had died, one of glioma of the brain and another from a safety-pin impacted in the bronchus; two from meningococcal meningitis, and one of septicæmia. Aspiration had failed completely in three cases in which late resection had been performed. On the other hand, children had been snatched from the grave by this method. The great ideal was to keep the cavity free from secondary infection, but it was difficult to prevent pus oozing round the edge of the cannula and the tube becoming displaced. It was essential to learn more about the physical signs until a slowly expanding lung could be distinguished with certainty from residual pus. Children should be sent into the country after early drainage to ensure rapid expansion.

The Importance of Physical Signs.

Dr. W. BROADBENT said diagnosis should be by physical signs before recourse to X rays. He cited several cases in his own practice and described the physical signs obtained from them. An interlobar empyema was often betrayed by a band of dullness in the second and third intercostal spaces in front or just below the spine of the scapula behind. If there was much pus the lower lobe might be so compressed that it was silent, causing a mistaken diagnosis of ordinary empyema. Unfortunately, physical signs differed in every case. The best place for a needle was in the upper axilla, with the arm at right angles to the chest. A very rare position for pus was between the mediastinum and the lung, the lower lobe being held to the chest wall. In old interlobar cases the lung should be stitched to the pleural opening unless the pleura was adherent. In ordinary empyema operation should be performed the day after pus had been withdrawn by aspiration; this lessened shock and gave the pleura a chance to become adherent.

Sir CHARTERS SYMONDS had had good results from irrigation, but the fluid should return immediately. Because replacement of the tube was difficult and painful, there was a tendency to slip a small one in, but if two tubes were used alternately there was no pain and no trouble. The size of the tube should bear some proportion to the size of the cavity. In old cases a metal tube was the best. A wire tube was useful, because granulations got between the interstices and held it in. It need not be removed until the cavity had shrunk to the same dimensions as the tube. He doubted if secondary infection could be prevented except by abundant application of cyanide gauze and a sheet of jaconet.

Dr. G. STEBBING discussed the conclusions arrived at from 158 cases. In none of them had resection been undertaken until the fluid was very purulent. When the pus was not localised they had been treated by frequent aspiration. The first conclusion was the value of operating as soon as the fluid was localised. There was a direct relation between the time allowed after localisation and the time taken in healing. Few of these wounds had lasted for three weeks, and many had healed within ten days. Secondly, radioscopic examination before operation was of great value. The tube inserted must be long, because often the diaphragm came up against the chest wall and shut the end of the tube up. The tube must be kept in. X rays were useful for checking the progress of treatment and for revealing pools of pus left undrained. Antiseptic drainage was too frequently neglected; the fluid was always infected and decomposition would go on until it was prevented. Suction drainage had not been successful; it made the patient very uncomfortable and had no advantage. Old discharging empyemata should be freely opened after the size of the cavity had been estimated by X rays. If the cavity was no smaller after three to five weeks some form of chest collapsing operation should be performed.

Dr. SEYMOUR BARLING emphasised the value of local anæsthesia. He had used Dr. Poynton's apparatus with success for infants, but for bigger children he preferred closed drainage. The sooner the tube was out the better in resection cases, provided care was taken to prevent the cavity closing too soon. Children were generally kept in bed much too long;

they needed country air and exercise. For the adult, golf was the best means of securing closure of the cavity.

Dr. G. MARSHALL described bad after-results in two cases. On theoretical grounds he strongly favoured negative pressure drainage. Every year he saw a few cases of amyloid disease due to small loculated collections of pus being left behind, and this was indeed the commonest cause of amyloid disease to-day.

Dr. LAKIN and Mr. TUDOR EDWARDS replied.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

ANNUAL CONFERENCE IN LONDON.

(*Concluded from p. 819.*)

THE Conference resumed on Oct. 16th under the chairmanship of Sir ARTHUR STANLEY, to discuss

The Principles Underlying a Scheme of Anti-tuberculosis Measures in any Country.

Sir ROBERT PHILIP said that the principles forming the basis of an effective antituberculosis campaign were simple, straightforward, and closely linked, yet the practical significance of scientific advance was still far from being adequately appreciated. A century ago, Boyle and Laënnec—both ultimately victims—had established the morphological unity of tuberculosis in all its varying expression. Its essentially infective character had been established by Villemin (1865) and Koch (1882). Those who had lived through the pre-bacillary and bacillary periods understood the revolution which had taken place. The almost universal distribution of tuberculosis had shown that the problem must be attacked by measures applicable to every member of the community. The ordinary citizen had to be educated on the nature of infection and means of control; a properly manned, suitably equipped, and readily available centre was essential for this, and its channels of effective activity were endless. Its supreme value lay in the incessant promulgation of the principles of healthy living. The far-reaching issues of the economic and occupational disturbance created by tuberculosis in a wage-earner called for an efficient care committee in connexion with every tuberculosis centre.

The infant was seldom, if ever, born tuberculous; infection was contracted in childhood and the child was generally tuberculised before puberty. Therefore preventive methods must be directed towards the infant, and the family doctor had important responsibility. In childhood the advent of infection could be determined almost to the moment. Once infected, the individual often remained under the influence of infection all his days, and effects might emerge at any time with extraordinarily varied manifestations and degrees of gravity. If early infection were more precisely interpreted and followed by satisfactory preventive measures gross disfigurements and crippling would disappear. The supreme efficiency of physiological hygienic environment in raising individual resistance had been proved, yet the lesson of the sanatorium had been inadequately applied in the preventive sphere. If the tuberculosis officer and family doctor were insistent on the re-creation of the home, and especially the nursery, on sanatorium lines, the danger in consequence of infection in childhood would be reduced to a minimum. Far better to run all schools on physiological lines than to erect special schools here and there for pronounced sufferers. The crying claim of the cells of the growing child was for greater and easier oxidation. Serviceable as medical and surgical treatment might be, the ultimate purpose before the Association was the eradication of tuberculosis. Whatever might emerge from present attempts at immunisation, the trend of scientific advance during the past 30 years clearly indicated that present policy lay along the lines of enlightening the public and training the doctor. Along these lines the need for curative institutions might be expected to disappear in a generation or so. The mortality from tuberculosis in London had decreased 45 per cent. in a quarter of a century, and an even greater drop had been recorded in New York.

A Canadian Organisation.

Dr. J. H. HOLBROOK (Medical Director of the Hamilton Health Association and the Mountain Sanatorium, Canada) described the fight against tuberculosis in Hamilton. The one original idea to which his Association laid claim was that of abandoning the despatch of patients to distant places for change of climate. It had been much easier to persuade patients to enter a local sanatorium, and this had paved the way for educational developments among the citizens. The mortality-rate for 1905, when the sanatorium had been established, was 126 per 100,000; for last year it was 49·5 per 100,000. The first factor in this excellent result was the whole-hearted support of the leading citizens and the people. A unit of about 100,000 inhabitants was easier to organise for public health work than a larger or a smaller one, and a third factor was that financial assistance from the city authorities had always been forthcoming. Thus it had been easy to remove open cases from the city to the sanatorium, and the spread of infection had been proportionally reduced. Home treatment had been found unsatisfactory, and patients were allowed to remain in the sanatorium as long as treatment was indicated. The visit of Sir Robert Philip in 1908 had inaugurated a clinic or clearing-house, as in Edinburgh. The clinic work had now been taken over by the department of health of the city, but the sanatorium still supplied the medical examiners, as well as placing itself at the service of general practitioners throughout the district. Closest coöperation was maintained between the antituberculosis association and the medical profession. Whilst seeking cases at an early stage, the Association had traced so many children that a "Preventorium" and outdoor school had been erected in 1909, and had grown until now there was accommodation for 80 children. The specialised diagnostic work of the clinic had proved very valuable to the military authorities during the war, and the sanatorium had received many tuberculous soldiers—about 3500 in all. From this new experience had arisen an appreciation of the value of occupational therapy and a new conception of psychotherapy in the treatment of tuberculosis. Economy had been relaxed for returned soldiers, and the equipment of the sanatorium had been enriched by an X ray plant, a dental department, and better laboratories. Consequently the number of civilian patients had been increased to about 500 in order to make the place an economic institution. These patients had all the benefits of the enlarged sanatorium at a fee of $1.50 per day, paid by the municipality for poor persons. Thus the sanatorium had become a provincial instead of a local one, a step which had also been rendered necessary by increasing facility of communications between the city community and the surrounding country. After-care had been given much thought, and the only feasible plan had been education of patients in the sanatorium during their long period of convalescence. A complete radio equipment had been most helpful in combating the feeling of being shut off from the world, and as a medium of regular lectures and courses of instruction. The conclusion had been reached that the younger patients were suffering from a lack of broad educational training. Appeals to various welfare organisations had resulted in the establishment of a scheme of education which included wireless lectures, library education, vocational training, and many handicraft activities. Teachers coached patients for their matriculation in English, French, Latin, and mathematics. A commercial course, including typewriting, stenography, and commercial art was also provided. The result had been a new outlook of hopefulness, which had revolutionised the institution.

The Importance of a First-class Tuberculosis Service.

Dr. G. LISSANT COX (Chief Tuberculosis Officer, Lancashire County Council) enunciated the principles of antituberculosis measures as the application of preventive public health or social measures and the accurate diagnosis and treatment of the individual patient. These platitudes, he said, brought out the important factor that we must drive two horses, and drive them tandem, the leading horse being Prevention. The three chief measures were the dispensary unit, including notification, the institutional unit, and after-care and education. The dispensary must be an organisation and not a building, and the commanding officer was the most important part of the whole thing. This was of vital importance. If the officer were incompetent because badly paid, if he were not provided with adequate means to be a real up-to-date specialist, if a real specialist could not be employed, then the money spent on any local scheme was mostly wasted. The officer should in all cases be whole-time at a pre-war salary of £400–£500. At the present day there were nearly as many part-time as whole-time officers, and few received this salary. The reasons for this were that many did not believe in whole-time tuberculosis work, thinking it was too expensive or too dull, and that the large number of small county and county borough authorities made it impossible for each to have a whole-time officer. The tendency to hand over the dispensary unit to the local sanitary authorities would mean a lowering of the standard of tuberculosis work and a divorce between the dispensary side and the institutional side of the work; it was most important that the tuberculosis officer should have beds at his disposal. The suggested remedy—appointment of consultant tuberculosis officers—merely provided three doctors instead of two to deal with one patient—the family doctor, the omnibus medical officer of health, and the consultant. The dispensary area should be not less than 250,000 population or the standard of work could not be maintained. Notification was necessary for any complete scheme, but was not as perfect as it should be. Notification should obtain not only all the cases, but the early stages. What was urgently required was a Framingham experiment in England—i.e., a house-to-house search for cases of tuberculosis. The cure for attendance too late at a centre was better education and teaching of hygiene, but periodic health examinations alone would reveal all early cases. The Astor Report had recommended one sanatorium bed and one hospital bed for 5000 population, and Lancashire had found this substantially correct. For children, one pulmonary bed per 24,000 and one non-pulmonary bed per 10,000 population were necessary. The three settlements that had been started were under private management. The scheme was not practicable under public administration, and 75 per cent. of cases were unsuitable for settlement life as organised at present. Moreover, multiplication of settlements would produce overcrowding of the market for the goods manufactured. There must be adequate accommodation in the institution for the isolation and nursing of advanced cases, and there was often too little of this. On the other hand, there should not be many such cases in any one institution, nor should patients be taken far from their homes. In Lancashire the problem had been attacked by providing in each dispensary area a hospital, run by the consultant tuberculosis officer and his assistants. This was cheap, allowed the superintendent to know the home conditions of his patients, and gave the tuberculosis officer charge of beds. The dispensary and hospital unit should not be divorced or under separate management. The success or failure of institutions depended largely on their size; none should have more than 150 beds. After-care committees were very valuable. The tuberculosis service must not get disheartened and must not run after every panacea. Given the means, it could and would conquer this terrible scourge.

Dr. JOURDRAN described the great effort made during the last three years to protect the people of Indo-China by "B.C.G." Over 50,000 vaccinations had been registered. 850 infants under Dr. Jourdran himself at the Maternity Hospital at Tonkin had been vaccinated during their first week of life, without a single accident. He spoke of the dark, crowded rooms in which these people lived, but believed that it was possible to educate them. A great debt of gratitude was owing, he said, to Government, Red Cross, and welfare work to improve the conditions of life, and also to the public health service of the League of Nations, which was a powerful help.

Mr. Councillor ORR (Derby), expressing a layman's point of view, said that health authorities should direct their attention to the young. New housing settlements were important factors in the fight, and fresh air, sunshine, and access to open country should be available. He pleaded for support for the National Playing Fields Association, and thought more advantage might be taken of the British Rotary movement.

Mr. H. D. LEVICK (Middlesbrough) quoted the saying that we cultivated more tuberculosis in our insanitary areas in one week than all our sanatoria could house in a year, and looked to the slums for the answer to the question why the final results of sanatorium treatment were not as good as had been hoped. The patient returned from the institution with a poor earning capacity and had therefore to live in a poor environment, so that the vicious circle of tuberculosis and poverty was established. The tuberculosis officer of Middlesbrough had taken a census two years ago, visiting 1159 homes of patients on the dispensary register. The majority were overcrowded two-, three- or four-roomed houses in a smoky industrial area. In 251 houses there were from two to seven families in residence, and three houses had more than seven. In 320 of these dwellings there were from one to seven lodgers; in 68 of them there were more than four to a bedroom. 486 tuberculous people were found sharing beds with healthy relatives. The incidence of the disease in the industrial ward was 6·19 per 1000; in a residential ward 2·16 per 1000, but in the garden colony it was only 1·6 per 1000. He urged the enthusiastic support of garden colonies, and thought the Ministry of Health should give financial encouragement to local authorities for garden colonies, permanent sanatoria for families, and preventoria for wives and children on the sanatorium estate.

The Rt. Hon. H. J. TENNANT (Treasurer) assured the meeting that the officers of the Association were most anxious to use the large sum of money now at their disposal in the prevention rather than in the cure of tuberculosis.

Sir JOHN ROBERTSON (Birmingham) said that nothing was more needed than a properly balanced statement such as that made by Sir Robert Philip. The layman was too apt to think of sanatoria, dispensaries, and medical officers, whereas tuberculosis was a biological problem to be dealt with biologically. It would be better to estimate tuberculosis by the number of new cases every year rather than by the deaths. He suggested an intimate investigation of the way of living of those who escaped tuberculosis, as well as of those who succumbed.

Dr. F. L. MORGAN (County Tuberculosis Officer, Northumberland County Council) pleaded for some practical scheme in the absence of funds adequate to the needs of a district. It was impossible to educate people who had insufficient food and were striving to keep a family of 13 or 14 when they could only afford three. The more money spent on "schemes" the higher the rates went, still further crippling trade and increasing poverty.

Councillor BROWN (Shoreditch) urged an attack on the housing problem, saying that sanitary inspectors were handicapped by having nowhere to put tuberculous families found in crowded houses. The Becontree scheme was failing because it was too expensive; a man with £2 10*s*. a week wages could not keep a family of three or four and pay 15*s*. or £1 rent, and then 8*s*. or 9*s*. fares to work. The Government

should be pressed to arrange free or reduced travel for workmen under a certain wage-scale. The "million houses" erected had all been for the middle classes, and so far nothing had been done for the really poor.

Sir ROBERT PHILIP, summarising the discussion, said that most of the stress had been laid on prevention. The Framingham experiment did not need repeating; it was complete, having proved that there were far more cases of tuberculosis in an area than were recognised by present methods. He warned the association that efforts must go along natural lines, and that Nature would not be hurried or fussed.

Dr. J. H. ELLIOTT (President, Canadian Tuberculosis Association) urged the importance of genuine preventive methods, comparable with the purification of water and food-supply in the prevention of typhoid. Treatment was important, but it was not the programme of that Association. Many methods had been mentioned, and all were valuable, but one that had not been referred to was the compulsory pasteurisation of milk. Surgical tuberculosis had practically disappeared from the wards of the Toronto hospitals when that city had made pasteurisation obligatory. Toronto had also found that it was essential to have the school inspection nurse, the public health visitor, the infectious diseases nurse, and the tuberculosis nurse all under one authority.

The CHAIRMAN, to whom a vote of thanks was proposed by the Treasurer, remarked that it was curious how these conferences always came round to the problem of housing in the end.

TUBERCULOSIS ASSOCIATION.

ARTIFICIAL PNEUMOTHORAX.

A MEETING of this Association was held on Oct. 17th under the chairmanship of Sir STCLAIR THOMSON, the President, when a discussion took place on artificial pneumothorax treatment.

Dr. R. R. TRAIL, who opened the discussion, dealt more especially with the difficulties met with in arranging for

Post-sanatorium Treatment for Middle-class Patients.

Such patients were unwilling to take advantage of the voluntary help available at the general hospital, but were also quite unable as private patients to afford the fees of experts. The speaker gave several examples of the difficulties encountered in arranging for refills for some of these patients. Dr. Trail said they had to insist on the fact that the induction of artificial pneumothorax was definitely the province of the physician rather than that of the surgeon. The giving of refills was not so specialised a procedure as was sometimes supposed. He suggested that the various sanatoria should offer facilities to physicians to acquire the technique, to see the refills being given, and to learn the type of case for which the treatment was suitable. Another suggestion made by Dr. Trail was that names should be sent in to him of physicians who were able and willing for a reasonable fee to carry on the treatment for middle-class patients.

In the discussion it was pointed out with regard to the proposed rota of names that an international list of this kind had been issued some time ago by an association formed for the purpose, but that this list was incomplete and inaccurate, at least as far as this country was concerned. Other speakers, while endorsing what had been said as to the difficulty of obtaining refills for ex-sanatorium cases—some patients having to travel 130 to 200 miles to get refills from persons qualified to give it—suggested that sanatorium physicians might be allowed to earn a modest fee by treating private patients.

Dr. PETER EDWARDS, speaking on the

Selection of Cases for Treatment,

said that he paid no attention to X ray findings in deciding as to the suitability or otherwise of a given case, but relied exclusively on the clinical findings. Where the disease was advancing he preferred to induce a pneumothorax too early rather than too late, and this was especially the case since he had begun to use sanocrysin in conjunction with collapse therapy. He thought that perhaps artificial pneumothorax treatment was feared because it was so often forgotten that it could at any time be discontinued with the greatest ease. Indications for its use included repeated small hæmoptyses, and persistent pleurisy without fluid, in which the pain was immediately relieved by the introduction of air. Where fluid was present, gas replacement was the simplest method of treatment. Artificial pneumothorax was the quickest route back to the workshop. The main contra-indications, apart from advanced bilateral or generalised tuberculosis, were emphysema, bronchitis, and asthma. Patients with cardiac disease, even in serious cases, could stand pneumothorax fairly well, as could patients with renal disease. Intestinal tuberculosis was an indication for the treatment rather than a contra-indication unless the disease was very far advanced.

Dr. G. T. HEBERT said that he always had an X ray photograph taken before doing an artificial pneumothorax, but he was not necessarily guided by it. Many cases of bilateral disease responded well to the treatment, as in a striking case of his own, which was briefly cited.

Dr. CLIVE RIVIERE said that, as their experience grew, more and more latitude was given to questions of disease in the other lung. With regard to asthma as a contra-indication, the speaker had had a case of quite marked asthma with tuberculosis of the right lung. The asthma had been present from childhood and had got better, but had later recurred as the pulmonary disease developed. Pneumothorax was induced on the right side; the asthma got better almost at once, and the breathing became easier with the collapse of the lung. Another speaker referred to the psychic effect of this form of treatment, especially in chronic sanatorium cases.

The PRESIDENT drew attention to the fact that laryngeal disease was no contra-indication whatever to the treatment; he himself had had no case that had not benefited by its use.

Duration of Treatment.

Dr. RIVIERE said that in a given case the chief points to be considered were:—

1. How much disease was present in the collapsed lung. With caseation or confluent disease, and especially where cavitation had occurred, the period must necessarily be longer than in other cases. In these days artificial pneumothorax was carried out by many more people and cases tended to drift into different hands, so that it was difficult to be certain what the condition was when the treatment was first instituted. The physician who started the pneumothorax should always, he thought, be the one to decide when it could be left off.
2. The amount of collapse. Where this was complete or nearly complete the period might usually be shorter than in less complete cases. The question of cavity was particularly important—i.e., whether the cavity was closed and whether the sputum still contained tubercle bacilli.
3. Another most important point that had to be considered was how far the lung would be able to re-expand at the end of treatment, or how far it was desirable for this to take place.
4. Yet another point was the condition of the other lung. Naturally, the period of treatment must depend on the spread of disease on the other side.

The tendency at the present time was to give longer periods of collapse than was at first thought desirable. Saugmann thought that five years was a reasonable period for collapse to be kept up; Dr. Riviere agreed with this, although in a very few cases he thought three years might be sufficient. In three or four of his own cases four years of collapse were followed by a period of quiescence, but relapse occurred later, one patient finally dying of pulmonary tuberculosis.

Difficulties of Induction.

Dr. S. VERE PEARSON agreed with Dr. Edwards that too much importance should not be attached to radiological findings, though he also agreed with Dr. Riviere

that they should not be ignored. Under favourable circumstances there was a chance of doing good by a pneumothorax first on one side and then on the other. A difficulty occasionally met with was cardiac oscillation, another being the fact that sometimes when fairly large amounts of gas—900 to 1000 c.cm.—were given the lung did not appear to be appreciably collapsed, and the edge could hardly be seen by the X rays. He suggested that in such cases the patients should be screened in every possible oblique position, by which a good deal of information might be obtained. Adhesions were a great source of difficulty, for very few of them were susceptible to treatment. He thought that it was unnecessary to cauterise even band-like adhesions, if the patient was getting on well in spite of their existence.

Some of the Canadian tuberculosis officers who are visiting England took part in the discussion. One of these drew attention to the value of phrenicotomy as an auxiliary measure, and also pointed out that short periods of collapse were especially useful in the case of children, who were apt to be frightened and nervous at the procedure. Another speaker said that he was not clear whether a distinction was made in this country between cases in which the treatment was undertaken as a curative or as a palliative measure. This, he thought, was an important distinction, if only from the point of view of statistics. He believed that it was better to continue the treatment indefinitely as long as the patient was doing well.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

AT a meeting of this Association held in London on Oct. 19th Dr. L. R. LEMPRIERE took the chair in the absence of the President, and Surgeon-Commander S. F. DUDLEY read the paper on

MICROBIC DISSEMINATION IN SCHOOLS

which appears on p. 849 of our present issue.

Dr. G. E. FRIEND, in opening the subsequent discussion, said that as soon as he began school work in 1923 he was struck by the large number of cases of medical illness which he thought should be preventable. Though now less innocent as regards the comparative agnosticism of the ordinary school authority in regard to biological phenomena, he still regarded the majority of these cases as preventable, but he was less certain whether medical officers were quite wise in trying to obtain too complete an immunity. Droplet infection—if the term included, as he thought it should, all the exanthems—accounted for over 70 per cent. of the total medical disability of Christ's Hospital School, and so far as he could judge from figures obtained from other schools this was a fair average. Taking two ten-yearly periods, for the second of which he had personal knowledge, the number of cases of medical illness worked out as shown in Table I.

TABLE I.

—	1903–12.		1913–22.	
Exanthems, &c.	2039	70 %	1998	77 %
Chills and tonsillitis	3616		2942	
Gastro-enteritis	1094	14 %	539	8 %
Various	838	11 %	886	14 %
Total	7587		6365	

Average days lost per boy, 6·0. 1923–28 show a reduction.

Thus only 11–14 per cent. of the illness was due to what must at present be regarded as unavoidable medical disability, while 84–85 per cent. was due to either droplet infection or gastro-enteric disturbance, a large proportion of the latter being caused by parental agency. On a conservative estimate at least 60–70 per cent. of this disability should theoretically be preventable. Isolation of infectious diseases combined with the exclusion from school of known contacts—a method in operation in most public schools since the Association published its code of "Infectious and Contagious Diseases in Schools" in 1888—had had a somewhat curious result so far as Christ's Hospital School was concerned. Accurate figures were only available for the period of 1902–28. Dividing this period into two equal parts the figures were as shown in Table II.

TABLE II.

—	1902–13.	1914–26.
Number of epidemics	119	89
Total number of cases	2048	3329
Average number of cases per epidemic	17	38
Epidemics with under 10 cases	79	53
,, of single case	34	25
,, of over 50 cases	11	24

1927–28 show a marked reduction pro rata, but the time is too short for the figures to be of value.

The result of this attempt at *prevention* had thus been a reduction in the number of epidemics by 30 with an *increase* in the total number of boys infected by 1281. Further, while the number of big epidemics of over 50 cases per epidemic had more than doubled, the number of epidemics with less than ten cases had been reduced by more than one-third. It was also undoubtedly true that in the case of measles, which only occurred in epidemic form when the proportion of non-immunes rose above 10 per cent. of the population, the type of disease was more severe and the number of boys who developed complications, especially in the later half of the epidemic, had more than doubled in the second period. Though exact figures before 1900 were not obtainable, the records definitely pointed to a more frequent occurrence of epidemics with a smaller number of cases per epidemic. Statistics as to the number of cases with complications for this early period were not available. Dr. Friend had little doubt that these figures provided definite evidence in favour of Surgeon-Commander Dudley's theory of droplet infection and supported his suggested doubt about the wisdom of trying to proceed too far in prevention.

TABLE III.

—	Dormitory.	Day-room.	Class-room.	Infirmary wards.	
Length	90	50	22	36	26
Width	21	21·5	21	25	25
Height	12	12	12	12	12
Cubic feet	22,200	13,000	5,500	10,800	7,800
Window area	200	220	100	220	120
	−117	+35	+22		
No. of boys	25	50	25–30	10	6
Cubic ft. per boy	888	260	220–183	1,080	1,300
Floor space	75	21·5	18·5–15·4 sq.ft.	109	100
Headroom	7·5	—	—	7·2	8·7
Inter. bed	4·5	—	—	4·2	5·7
Space between opposite beds	9	—	—	13	13

In regard to the auto-inoculation of non-immunes to measles during an epidemic the following figures were of interest: in January, 1921, 61 cases had occurred. The card-index had shown that there were 146 non-immunes. As the result of more careful inquiry these were reduced (41 per cent. of the non-immunes) to 104. The epidemic had affected every house in the school and 43 boys had escaped infection over a period of 44 days, though all were equally exposed to infection. The three other epidemics of 20 cases or over showed that from 10 to 35 per cent. of the non-immunes escaped every epidemic. In the two epidemics of over 50 cases the number of cases with complications was 15 per cent. and 60 per cent. in totals of 61 and 142 respectively, while the percentage in the small epidemics was either zero or negligible.

Dr. Friend concluded by giving the measurements of rooms at Christ's Hospital School (Table III). It should be noted that in the dormitories the boys spent an average of 10·5 hours at rest in 888 cubic

feet with 75 square feet of floor space, and 7 feet of headroom. In the dayrooms the same boys spent 3 hours in summer and from 5 to 7 hours in winter working and playing at tables in close proximity—most of this time in less than 260 cubic feet, with only 21·5 square feet floor space, and not 2 feet of headroom. An average of 4 hours daily for 6 days per week was spent in the classrooms with desks in close proximity in less than 200 cubic feet and with 15 to 18 square feet of floor space, and 2–3 feet of headroom. Other things being equal, there was therefore much more likelihood of droplet infection in the dayroom and classroom than in the dormitory.*

Dr. P. M. MAY said that it diluted his enthusiasm to hear that by giving such assiduous care to reducing the incidence of zymotic diseases in such special schools as the one at Greenwich, the best was not being done for the health of those boys whose career was destined to be in the Royal Navy, seeing that the conditions in the Navy were not likely to be as good as those in the school. It was agreed among medical men that the larger the space procurable per boy or girl the better, but those responsible for constructing and maintaining schools could not always be persuaded of this, especially when applications for places in the school were numerous. There was need for general enlightenment as to the spread of infection in school dormitories.

The CHAIRMAN said that droplet infection was so much on the increase, and the facts in regard to it so clear, that nothing should be neglected in the effort to improve conditions. Influenza and the ordinary feverish chill—he regarded the latter as the great danger of all school life—had doubled in the ten years 1903–12. Droplet infections should not be allowed to remain such a scourge of school life; they caused much more loss of time and were a greater danger to life than all the exanthemata combined. He hoped for a good deal from vaccine therapy. It was true that amid infective conditions a boy might be gradually acquiring immunity, but it was at considerable risk of breaking down and becoming the victim of some permanent damage. He had tried a general vaccination in his own school, but the number of parents willing to have this done was a diminishing quantity.

Dr. J. G. FORBES said this question of the spread of infection had a very wide bearing; it was concerned in every closely aggregated community, and especially in residential institutions. In class-rooms close contiguity was unavoidable; therefore careful attention should be given to ventilation. In influenza epidemics, 'buses, tubes, and trams were great factors in the spread of the infection. Further factors were humidity and barometric pressure. The gradual development of immunity in the individual as an element of protection to the herd was a large question, and the references to it in the paper afforded valuable food for thought.

Dr. J. A. GLOVER thought the special case of the sailor, to which Surgeon-Commander Dudley had drawn attention, should not obscure the general question of the reduction of the amount of illness due to droplet infection, especially as the risks of aural disease, pneumonia, &c., were so well known.

Surgeon-Commander DUDLEY, in reply, said the main point was whether it was better to have large batches of very severe cases separated by considerable intervals of time, or a succession of small groups of cases, less severe, which occurred in the process of building up immunity in the herd. He had experience of an epidemic of diphtheria in a small place in New Zealand of 1500 inhabitants where there had been no case of the disease for ten years. There were many cases and a number of deaths, and the morbidity in four months equalled that of 30 years in London. He agreed that the great hope was to carry out efficient vaccination. This certainly had the effect of greatly increasing the natural resistance of the recipient.

* A Memorandum on the Accommodation for the Sick provided at certain Public Schools for Boys in England, by Capt. W. Dalrymple-Champneys, M.R.C.P., has now been issued by the Ministry of Health. (London: H.M. Stationery Office, pp. 35, 1s. net.)—ED. L.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

ANNUAL MEETING IN ENGLAND.

(*Concluded from p. 815.*)

THE Society was received at Harrogate on Oct. 12th. Dr. W. EDGECOMBE, Vice-President, welcomed the members and gave an account of the various types of waters, after which parties of various nationalities, with interpreters, viewed the bath establishments. In the evening a banquet was given by the Mayor and Corporation, and the representatives of France and Germany proposed the prosperity of Harrogate.

The Third Medical Discussion on the

SPA TREATMENT OF CHILDREN

took place at the Royal Mineral Water Hospital the following morning. Dr. ARNIM KELLER (Switzerland), in a paper on the use of brine baths, gave the results of 20 years' experience in the children's department (114 beds) at the Spa Hospital at Rheinfelden. Up to the end of 1927, 10,107 children, of an average age of 10 years, had been treated with these baths, usually with excellent results. The great majority of the children showed "general weakness, lymphatic constitution, or scrofulosis," but "surgical" rheumatic and heart cases also did well.

Prof. GROEDEL (Bad Nauheim) spoke of the value of CO_2 baths in children after rheumatic endocarditis, as well as in the circulatory disorders associated with malnutrition and anæmia. In congenital cardiac cases compensation was often improved by these baths.

Dr. SIGMUND WASSERMANN (Franzensbad and Vienna) contributed an interesting paper on the action of ferruginous waters. Recent work had shown that only the unstable ferrous salts, such as those that occurred in absolutely fresh chalybeate waters, were therapeutically active. Such waters, as well as mud baths, had a definite use for delicate, anæmic, and catarrhal children. Prof. J. D. STANLEY (Birmingham) reported on the use of hot packs or baths in chorea. In many cases good results were obtained. The subnormal temperature observed was probably due to derangement of heat control by rheumatic infection.

Dr. ANGLADA (la Bourboule), in a paper presented by Dr. Ferryrolles, held that the muriated arsenical waters which are extensively employed for children are of benefit in three types of disorders: (1) of mucous membranes, (2) cutaneous, (3) arthritic.

A paper was also communicated by Dr. CATTANEO (Salso Maggiore) on the use of "dry pulverisation" of chloride-iodide waters. In an atmosphere so charged the dry particles find their way into the pulmonary alveoli and favourably affect both local catarrhs and the general want of resistance so commonly met with. This form of treatment may be used with much advantage in the first two years of life.

In the subsequent discussion it was remarked that most of the methods of treatment described were recommended for similar types of patients, and it was suggested that a more precise differentiation of methods, with corresponding indications, should be studied at the next annual meeting in Hungary.

After the meeting the members enjoyed a clinical demonstration of various forms of arthritis given by the hospital staff. Dr. J. A. THOMSON showed series of radiographs of osteo-arthritis, and described in joints so affected small areas of rarefaction, or cavities, surrounded by an osteo-sclerotic wall, suggesting that simultaneous bone destruction and bone defence was characteristic of this disease.

In the evening the party was entertained by the Harrogate Medical Society.

The final discussion of this meeting took place at the Devonshire Hospital, Buxton, on Oct. 15th. Dr. C. W. BUCKLEY presided in the absence of Lord Dawson. The aspect of

RHEUMATISM AS A NATIONAL PROBLEM

was dealt with in a series of reports from seven

different countries. Dr. HENRI FORESTIER (Aix-les-Bains) spoke for the Association which has been formed in France to deal with the question. Prof. PRUSIK (Prague) said that in Czecho-Slovakia a widespread scientific and public propaganda was in progress. Dr. ZOLTAN DALMADY (Budapest) mentioned that rheumatism was rarer in Hungary than in many other European countries. The use of mineral baths was habitual and popular in Hungary. Dr. MAX HIRSCH (Berlin) stated that they had come to the conclusion in his country that it would be better to form a society to combat rheumatism, in order that they could be registered and have the support of the State. He had collected statistics of the incidence of rheumatism in Germany, and found that the figures were similar to those for England. They in Germany had also formed the opinion that the influence of rheumatic diseases upon industry was more serious than that of tuberculosis. "The German Society is much impressed by the possibilities of international coöperation," he added. Dr. ZIMMER, secretary of the German Society, gave an outline of its programme (see *Arch. of Med. Hydr.*, August, 1928).

Appreciative references to the work of the International Society were made by Dr. J. VAN BREEMEN (Amsterdam). "Good organisation is essential," he stated, "but actually it is nothing but a shell, and if no flesh and blood be added, the organisation soon shrivels up to a skeleton. It is, therefore, a most important fact that in the course of the two years the International Committee has existed the firm foundations have already been laid for a grand edifice, the completion of which will take years yet, but which bears the unmistakable signs of solid construction."

Dr. R. FORTESCUE FOX (London) said that in England they had been very fortunate in that they had had the assistance of representatives from the Ministry of Health, the London County Council, the British Medical Association, and, equally important, the great industrial organisations. "I think the resultant coöperation of industrial and medical men has already been invaluable in our country," he added. In some other countries they had not had that coöperation. Referring to the efforts which had been made to widen the scope of spa treatment, Dr. Fox said they could not dream that the whole of the population could be treated at the spas, so they were bound to consider the provision of centres for treatment of rheumatic diseases in the towns, as in some other countries.

Further reference to rheumatism clinics was made in a paper by Dr. A. R. NELIGAN, read in the compiler's absence by Dr. W. S. C. COPEMAN, one of the honorary secretaries. The English spas, he said, are good, well staffed, and well equipped, and their more general use should be urged. On the continent going to a spa is regarded much in the same light as going to a pharmacy in England, but the spa does not solve the whole problem of chronic rheumatism even on the continent. There had been set up, therefore, in the large cities a system of clinics for the treatment of rheumatism. In New York and other cities of America arthritis clinics were becoming common. Such clinics should be centres of research in rheumatic diseases, of diagnosis and special treatment, in full coöperation with hospitals and health resorts.

Following brief reports from Swedish, Portuguese, and Danish representatives, Mr. W. A. APPLETON (General Federation of Trade Unions), speaking on behalf of the friendly societies, agreed that rheumatism was a national problem. It divided itself automatically into a medical side and an economic side—he would confine his remarks to the latter. First mentioning that in the friendly societies' membership there was required 18,000 weeks' treatment per year, Mr. Appleton stated that there was a great deal of misunderstanding regarding the money held by the insurance societies.

Doctors refer to it as surplus, he said, but we speak of it as reserve built up against contingent liabilities. He urged the medical men to be sympathetic if the societies appeared to go slowly with regard to the treatment of rheumatism. It is due entirely to financial doubt, he explained. Mr. Appleton prophesied that within a comparatively short period, perhaps two or three years, some rational scheme would be in operation.

Discussion.

Dr. G. L. KERR PRINGLE (Harrogate) suggested that if clinics were established the cases treated there might become chronic, and that chronic cases would be sent to the spas.

"The places to treat rheumatic diseases are the spas," was the view of Dr. JOHN MURRAY (Llandrindod). It was important, he added, that our working classes were kept sound and well. If we, as a nation, could not afford two or three millions a year to do this, and yet could spend 800 millions on other things, then it was time the government of the country was altered. Every county should have its rheumatism officer, just as it had its tuberculosis officer. The friendly societies should not be saddled with the burden alone. It was a national problem, not only involving people who work with their hands, but also those who work with their heads.

In summing up, Dr. BUCKLEY made reference to each report which had been given. Speaking of the German report, he remarked that Dr. Zimmer had said they in that country had the moral and *financial* support of their Ministry. Already we in England have our Ministry's moral support, he added, and we trust that in the future, as the result of the force of public opinion, we also shall have the financial support. Dealing with Mr. Appleton's comments on the question of the friendly societies' finance, Dr. Buckley suggested that surely rheumatism could be regarded as one of their most serious "contingent liabilities." So long as the insurance companies allowed so many weeks of labour to be lost through this disease, they must expect a heavy drain upon their resources.

At a meeting of the members of the former International Committee on Rheumatism, held in the Devonshire Hospital, at Buxton, on Oct. 15th, an International League against Rheumatism was duly constituted. Representatives were present of the national committees and associations for combating rheumatism in Germany, France, Czecho-Slovakia, Hungary, Holland, Sweden, Switzerland, and England. Other delegates of the committees in Russia, Austria, and Belgium sent their adhesion in writing. The following officers were appointed: Chairman, Dr. Fortescue Fox (pro tem); vice-chairman, Prof. Dietrich; hon. secretary, Dr. van Breemen. The central office is: 489 Keizersgracht, Amsterdam. The functions of the League, as of the former International Committee, will be mainly advisory and coördinative.

At Droitwich Spa the Society was warmly received and entertained to lunch and tea by the Corbett Trustees, and under the guidance of local medical men, members were given an opportunity of seeing one of the strongest brines in the world. The possibilities of Droitwich as an international spa, especially for children, were referred to by several authorities present.

The annual meeting tour ended with a visit to Bath, where the various baths and springs were studied, and where members had the opportunity of clinical demonstrations by the local physicians of rheumatic cases at the Royal Mineral Water Hospital, besides inspection of the Roman baths and town.

Throughout the tour the Society was received with the utmost hospitality and kindness, the Mayor and Corporations, the local medical societies, and baths committees vying with each other in providing banquets, civic lunches, and interesting excursions.

Next year's meeting will be held in Hungary early in October.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

ON Oct. 23rd, with the Vice-President, Dr. ROBERT HUTCHISON in the chair, this Section held a meeting (to which the Section of Psychiatry was invited) to discuss the subject of

HYPOCHONDRIA.

Dr. R. D. GILLESPIE, in his opening paper, said that the condition was one of a distinct reaction type, which was well worth isolating, because of its therapeutic and prognostic aspects. It was not a disease. It had long been, and still was, identified and confused with melancholia, hysteria, neurasthenia, and certain other conditions. Some older psychologists spoke of a "hypochondria cum materia" when gross organic disease was found and "hypochondria sine materia" when no important physical disease was evident. It was a matter of controversy whether hypochondria existed per se, or only as part of a larger symptom-complex. He believed such a syndrome could usefully be distinguished. It was a subject which at the present day suffered from comparative neglect. He considered hypochondria to be a persistent preoccupation concerning the bodily health to a degree in excess of what would be justified by any physical disturbance which happened to be present; an emotional attitude which was best described as interest with conviction, anxiety (in the sense of a fearful apprehension of disease) being absent. In the patient's mind the presence of disease was a settled conviction. This condition, Dr. Gillespie contended, was inaccessible to psychotherapy, and ran a chronic course without intellectual or emotional deterioration. For a long time hypochondria was considered to be a form of neurasthenia; Kraepelin, in fact, placed it among the neurasthenias. It should be differentiated from anxious preoccupation. Depression or affective sadness was no part of the concept. Whereas the hysterical patient was susceptible to reassurance, the hypochondriac was not. Hypochondria developed in the type of person who had led a subjective and solitary life. The common-sense view of the condition was that it consisted not of the direct expression of organic brain disease, but rather of a reaction to influences, either external or internal, as an excuse for voicing some trouble. The fixity of the symptoms was attributed to habitual self-centredness. The condition usually arose in later life, at which time there was said to be an increasing tendency to become largely interested in the bodily health. The common-sense view left untouched, however, the reason why such self-centredness existed, and why there was this fixity. The alleged preponderance of hypochondria in the male sex was explained by the fact that similar manifestations in the female were designated hysteria, though the speaker contended that there a distinct difference between the two conditions.

The prognosis of hypochondria, Dr. Gillespie continued, must depend in part on the relative importance of the exogenous and endogenous factors. The more the condition seemed dependent on a physical abnormality, the more likely were the symptoms to disappear when that had been dealt with; but when it was rather an outgrowth of the personality the outlook was more doubtful, as the personality was so often suffused with unhealthy attitudes. Cases in young persons might be regarded as more favourable than cases in the old. By way of treatment any organic disease present should be dealt with. These people did not lend themselves to profound analysis, but common-sense measures, such as change of occupation and environment, should always be tried.

Discussion.

Dr. R. S. ALLISON agreed that hypochondria could be regarded as a definite entity, and not merely as a variety of some other condition. Often the physician was confronted with a patient who showed no abnormality save an undue concentration on his bodily sensations; but hypochondria was more than that. In fact, it did not differ greatly from the anxiety of neurasthenic states. He liked Dr. Gillespie's definition that it was "an interest with conviction." A distinctive point was the patient's persistent search for a cure, by means which even the sick man would not resort to. When the symptoms were said by the patient to centre around the alimentary tract, it was important to search for any cause of real symptoms, though the hypochondriac was a difficult subject to investigate, and might be in such a hurry for results that he was unwilling for a barium meal to pass naturally, but quickened it by taking purgatives. When a person had had an operation at some previous time the possibility of there being adhesions should be looked into. To try to remove the patient's false impression was to embark on a forlorn hope. If organic disease contributed to the trouble, removal of this rendered the prognosis much more hopeful than when there was no such disease. The inculcation of good daily habits, such as the regular use of liquid paraffin, would do much. It was also rational to give bromide in small regular doses.

Dr. W. R. REYNELL considered that Dr. Gillespie had established his thesis that there was a definite clinical entity such as he described, though—as so delimited—it was rare. His remark that there was a preoccupation in excess of what the physical symptoms justified presented a difficulty, Dr. Reynell thought, as it was difficult to assess what degree of preoccupation was justified in a case of marked visceroptosis. He did not agree that when disease was absent though the patient considered he had it the case was inaccessible to psychotherapy. In a large number of cases this treatment was possible. He thought it was often possible to tell, even in childhood, what type of person was liable to become a hypochondriac. It was the person of low vitality and low blood pressure, of the toxic, debilitated type—a type abnormally liable to feelings of illness—and very hyperæsthetic. In a word, these patients were prone to dysæsthesia, and it was possible to benefit them greatly by rational psychotherapy. The best drug for them was the spoken word—spoken in the right way.

Dr. T. A. ROSS thought it would be a great achievement to be able to determine which psychoneurotic cases were likely to benefit from treatment and which were not, as treatment took a long time, and energies could thereby be conserved for the hopeful cases. There was a type of old man in this category who was quite inaccessible to treatment; the important thing for such a patient was to keep him out of the hands of quacks. He thought that Dr. Gillespie's description was a description of a type of life rather than of a disease.

Dr. C. P. SYMONDS also thought that the opener had established a very definite clinical picture, but he did not feel so certain that he had shown it to be a definite type of mental reaction separable from the manic-depressive and hysterical groups. The form associated with manic-depressive psychoses was the one too often missed by the general practitioner and the general physician; he referred to the mild depressive psychotic whose symptoms were expressed rather in the way of bodily symptoms than as a frank mental disorder. Most of them were sent to the neurologist with the diagnosis of neurasthenia, but by that time they had usually been under one or more operations. Too often in these cases a history of some previous nervous breakdown was not pointedly inquired for. Apart from such a history there were associated symptoms and signs of value in diagnosis, such as self-depreciation and self-reproach, with a sluggishness of response, evident to the patient and supported during the physician's examination. There was also a tendency to a marked increase in the symptoms in the early part of the day, with a distinct lifting of the cloud as the day advanced. The manic-depressive group were relatively inaccessible to psychotherapy, but not so the young people whose fear was

not based on a settled conviction of disease. This difference might be one merely of degree, not a qualitative one. The schizophrenic with hypochondriacal symptoms might be difficult to diagnose in an early stage. He discouraged the idea of making inaccessibility to therapy a criterion of diagnosis.

Dr. PARKES WEBER thought the term hypochondria should be limited to the kind of case to which Dr. Ross referred.

Dr. F. DILLON spoke of the sadism which was so often expressed in the hypochondriacal state. It was difficult to conceive that a man who insisted on half a dozen abdominal operations was doing it from any mere egoistic motive; the most probable explanation, he thought, was that the man was identifying himself with someone else, and in that way was deriving antagonistic satisfaction.

Dr. JOHN CARSWELL said his hope had been that the term hypochondria, if employed at all, would be restricted to the involutional case. He had seen hypochondrial symptoms as the earliest manifestations of general paralysis of the insane; sometimes in early phases of dementia præcox. Even a patient with delirium tremens might display, in the pre-delirium stage, a restless anxious reference to bodily symptoms. He had never seen a hypochondriac who got the better of the physical condition who did not carry out self-treatment in defiance of his medical man, and some such lived to a good age. He was always self-centred, bent upon giving himself a good time, and he rigorously shut out of his mind all other considerations.

The CHAIRMAN said that he, in common with every general physician, saw the hypochondriac as an ordinary harmless person, and one who certainly was not insane. He agreed with the opener that the hypochondriac was usually an elderly gentleman who had retired from business, and who collected symptoms, very much as another old gentleman would collect postage stamps or old china. His health had, in fact, become his hobby. True, most of the items in his collection were fakes, but every now and again he came upon something which was real, and this was apt to be overlooked by the physician, who had arrived at the conclusion that it was all fake. Such a man was harmless and incurable; indeed, the speaker did not want to cure him, for, from the point of view of the patient, it would be unkind to do so. The hypochondriac was said to be egocentric, but he was not always so, for one could recognise the vicarious hypochondriac. Numbers of parents were desperately hypochondriacal about their children, but not about themselves. The extravagantly fussy type of parent was well known. Even a whole nation could become hypochondriacal. A case in point was the Jewish race. Ever since Moses was so ill-advised as to lay down for the people's observance a sanitary code, they had been a nation which had devoted far too much attention to ills and the discovery of imaginary illnesses. Hysteria had always seemed to him to be something different. The hysterical person seemed to have some definite purpose to serve in his manifestations, whereas the hypochondriac's collection of symptoms seemed purposeless, being rather in the nature of some definite occupation. As Dr. Gillespie said, there was but a small literature on the subject, yet it would always remain for the physician one of very great interest.

Dr. GILLESPIE, in reply, said he did not include among hypochondriacs those who suffered from visceroptosis. Even among presumably educated people physiological knowledge was still very inadequate. Often the type of subjects under discussion suffered from an ever-present consciousness of guilt.

LONDON FEVER HOSPITAL.—This institution, in Liverpool-road, Islington, which was founded in 1802, and has 178 beds, is seeking to raise £50,000 by the first general appeal it has ever made. A new isolation building is a pressing necessity, the old one being out of date and beyond repair. It is pointed out that this is the only voluntary fever hospital in and around London.

Reviews and Notices of Books.

STERILITY IN WOMEN.

Diagnosis and Treatment. By SIDNEY FORSDIKE, M.D., B.S. Lond., F.R.C.S. Eng. and Edin., Surgeon to the Hospital for Women, Soho-square. London: H. K. Lewis and Co., Ltd. 1928. With 25 illustrations and 17 plates. Pp. viii.+133. 9*s*.

So many advances have been made in the diagnosis and treatment of sterility during the last ten years that Dr. Forsdike has been tempted to give some account of these from his own wide experience. The method of investigating a case is well and clearly described, and the case sheet devised by the author will prove useful to other workers. Stress is laid on the importance of examining the husband who, according to Dr. Forsdike's records, is responsible for sterile union in 25 per cent. of cases. "In ordinary cases the investigation of the woman ceases at the bimanual examination until a report has been obtained of the man's condition." The technique of tubal inflation as practised by the author is fully described. No anæsthetic is used, and a pressure of 300 mm. Hg is considered safe. Out of 100 cases in which the tubes were inflated 15 became pregnant without further treatment at periods varying from 1 to 12 months. Later in the book it is stated that unless the pregnancy occurs within three months of the inflation it cannot be regarded as due to it; if this test is applied only 7 of the 15 can be regarded as possibly due to the inflation, and three of these occurred in patients married only two years. Even when the strictest tests are applied, however, the author's contention that inflation alone is responsible for the cure of sterility in certain cases is borne out. If pregnancy does not follow in three months after inflation lipiodol is used and a hysterogram taken. This method of demonstrating the site of obstruction in closed tubes was described by Dr. Forsdike in 1925, and since then he has used it in a large number of cases. His technique is clearly described, and excellent pictures illustrate X ray findings after injection. Of 67 cases in which lipiodol was used, the tubes were found to be patent in 41; of these 41, pregnancy followed in 14 without any further treatment. A critical examination of the details of these cases will perhaps carry less conviction than the cases of pregnancy after inflation, but as to the value of lipiodol as a diagnostic agent there can be no doubt. The chapters on treatment leave nothing to be desired. In tubal obstruction the author recommends operation only when the closure is situated at the fimbriated end; even then, in 20 cases in which an opening was made at this end, 11 were found to be closed again in three months, and only two of the 20 became pregnant and bore living children. Excision and anastomosis of the isthmus and implantation of the distal end of the tube in the uterine wall are condemned. In none of ten operations of this kind did air pass at the end of the operation. Dr. Forsdike concludes that "operations upon this part of the tube offer no prospect of relieving sterility." It is unfortunate that a book so excellent in substance should here and there be disfigured by sentences carelessly constructed. On the first page, for example, sterility is defined as "a woman who offers no evidence of being fertilised." Moreover, though the causes of sterility are thoroughly discussed, the classification is confusing and does not seem to be adhered to even by the author. Thus the Empress Josephine is classed as "relatively sterile," while at page 19 "relative sterility" is included as a variety of "congenital." Surely she was really an example of "secondary sterility" following infection after her second labour.

The monograph shows in every page evidence of rich personal experience, and will well repay the most careful study.

PSYCHOLOGY AND PHYSIOLOGY.

Common Principles in Psychology and Physiology. By JOHN MACCURDY, M.A., M.D. (Johns Hopkins). London: Cambridge University Press. 1928. Pp. 280. 15*s*.

THE time has not yet arrived when the problems of psychology and physiology can be satisfactorily solved in terms of one another. It belongs to philosophy alone to establish a unification of all the phenomena—mental and physical—that make up the organism. But the workers in both fields need to understand one another's aims, and seeing that a considerable amount of overlap takes place controversy over territorial rights may arise from time to time which are profitable to neither side. Dr. Maccurdy's effort to produce a common vocabulary which shall help psychologists and physiologists to work side by side to further these ends which they have in common must therefore be welcomed. In the pattern theory, familiar to us in the mnemic theory of Semon, the author finds convenient ground to work on, and his book is mainly concerned with the establishment of the way in which patterns are found in, and can be used to explain, the phenomena of body and mind. Behaviourism alone, however, will not explain the growth of experience, and unless mental categories are considered such facts as W. Kohler collected on the behaviour of apes, or the processes found in neural integration and the development of the embryo, are incomprehensible. The first steps in correlating different aspects of knowledge cannot be expected to lead to a terminology which will be acceptable from all points of view, and it is satisfactory to see that anyhow a start has been made on sound lines.

Principles of Abnormal Psychology. By E. S. CONKLIN, Professor of Psychiatry in the University of Oregon. London: George Allen and Unwin. Pp. 457. 15*s*.

Prof. Conklin has given us a very interesting volume on the elementary data of abnormal psychology. The merits of the work lie mainly in a mine of information relating to the psychosis, psychoneurosis, and the analytic approach and its effects. It also has the merits of bringing into the orbit of psychopathology the phenomena of spiritism and sleep. All subjects are dealt with in an entertaining and stimulating way. The demerits of the book in form and content cannot, however, be ignored. For example, illusion and hallucination are dealt with before the fundamental facts of memory and its anomalies are discussed. The psychoses are considered before the psychoneuroses or shell shock. These sections are full of information, but the views are not sufficiently developed to include the most recent developments in Freud's position, nor the psychiatric advances in Germany and Switzerland by E. Kretschmer and E. Bleuler. The time may not yet have arrived for the correlation in a textbook of the recent work on sleep. But in a volume of this size and character space might have been found for a consideration of the sleep and behaviour disturbances in encephalitis lethargica and their relation to the physiology of the mid-brain as exhibited in the narcolepsies, and the cortical inhibition theory of Pavlov. The book, however, should prove stimulating to the elementary student of psychopathology who wants a lot of practical matter in a compact form without too much speculation.

A TREATISE ON KALA-AZAR.

By UPENDRANATH BRAHMACHARI, K.I.H. Rai Bahadur, M.A., M.D., Ph.D., late Physician, Medical College Hospital, Calcutta. London: John Bale, Sons and Danielsson, Ltd. 1928. Pp. 252. 21*s*.

SEVERAL books dealing with different aspects of kala-azar have recently appeared, but none of them can compare with the present volume, either in wealth of information supplied, or in style of production. The main outlines of the treatise were sketched out by the author in the third edition of Mense's "Handbuch der Tropenkrankheiten." The work now published is more exhaustive, and is divided into sections dealing with history, ætiology, inoculation experiments and lesions produced in experimental animals, the transmission of the disease, especially by the sandfly, canine leishmaniasis, the clinical varieties, complications, prognosis, diagnosis, pathology, treatment, and prophylaxis. There are numerous appendices and a very complete bibliography. The monograph is indeed comprehensive, and supplies a useful account of the author's own original work on this disease, as well as a balanced comment on that of others.

From a strictly clinical aspect the section on symptomatology is neither so exhaustive nor expressive as the others. It is perhaps unfortunate that the book has appeared at a time when the mode of transmission of kala-azar is still being worked out, so that it has not been possible to express conclusions other than tentative ones regarding the sandfly question. The section on treatment is very good, special prominence being given to treatment with urea stibamine, the compound of urea with stibanilic acid discovered by the author in 1921. He has shown that its toxicity to humans is low and its curative power as great, if not greater, than other pentavalent compounds of antimony. The monograph is well illustrated with 12 plates, several coloured, mainly derived from other publications, and some 32 text figures.

FOOD, HEALTH, VITAMINS.

Being a new edition of Food and Health. By R. H. A. PLIMMER, D.Sc. Lond., Professor of Chemistry in the University of London, at St. Thomas's Hospital Medical School; and VIOLET G. PLIMMER. London: Longmans, Green and Co., Ltd. 1928. Pp. 120. 3*s*.

VITAMIN lore accumulates so quickly that any up-to-date book on the subject has an enormous advantage at the time of its appearance over any other. This volume contains an account of the differentiation of vitamin B 1 from vitamin B 2, and of the latest discoveries about vitamin D, and is therefore, if only because of the inclusion of this material, a useful and helpful contribution to the literature of vitamins. Prof. and Mrs. Plimmer set out to describe the chief facts about diet in a way which everyone can understand, and though the exposition is not always as interesting as it might be, the information given is sound enough. Most research workers tend to cherish a belief that the population of Great Britain for the most part suffers from a partial lack of some given vitamin, and that if the lack were made good the public health would greatly benefit. The authors of this book favour a deficiency of vitamin B 1, and therefore plead for a greater consumption of substances which contain it. Others who hold that vitamin D is more likely to be the chief defaulter will suffer a shock when they read that the adult "can safely eat margarine instead of butter" provided that he eats the other foods named. The authors' view, however, is confirmed on other grounds by the most recent work of the Pharmaceutical Society's Laboratories, published in our issue of Oct. 6th.

The science of dietetics is one in which it is very hard to make dogmatic pronouncements, while it is one in which there is a clamorous demand that generalisations should be provided for the public. On the whole Prof. and Mrs. Plimmer have provided a useful book; it contains a few inaccuracies and one or two bits of very strange English, but the layman will carry away from it much that is helpful and little that is actually misleading. The book is certainly among the best of its size and scope and meets the demand for information on a subject of growing importance.

ATOMIC STRUCTURE AS MODIFIED BY OXIDATION AND REDUCTION.

By WILLIAM COLEBROOK REYNOLDS, D.Sc., F.I.C., A.R.C.S. London: Longmans, Green and Co. 1928. Pp. 128. 7*s.* 6*d.*

THIS is a theoretical investigation of the structural changes which are supposed to occur in atoms during the processes of oxidation and reduction. Starting with the thesis that electrons fall naturally into three classes according to their functions—namely, valence electrons, potential valence electrons, and radial quartets and pairs—Dr. Reynolds proceeds to characterise these three groups. In his view the recognition of the part played by these potential valence electrons leads to a modified conception of the periodic classification of the elements. Two chapters are devoted to the oxidation and reduction of typical inorganic and organic compounds, while subsequent chapters deal with the nature of chromophores, the emission and absorption of radiation, the structure of solid conductors and magnets, and electrons, protons, and ether.

Many of the ideas put forward by the author are unorthodox, and he is to be congratulated on having written a stimulating and suggestive little book.

THE LIFE OF THE CELL.

By DAVID LANDSBOROUGH THOMSON, M.A., B.Sc., Ph.D., Lecturer in Biochemistry, McGill University, Montreal. London: Thornton Butterworth, Ltd. 1928. Pp. 252. 2*s.*

WITH the constantly increasing literature relating to the chemistry, physics, and physiology of the cell it becomes more and more difficult for the average reader to disentangle the various threads and to weave them into a connected whole. Those who have not the time to consult larger works should welcome the opportunity offered by this little book for placing themselves abreast of the more recent developments. In simple language, though without sacrificing essentials, the author discourses lucidly upon colloids, surface activity, enzymes, oxidative mechanisms, genetics, &c. His book is divided into five chapters, the first of which is devoted to the visible structure of the cell, the second to the chemical structure, the third and fourth to the chemical and physical dynamics respectively of the cell, while the last chapter gives an account of the life-history of germ cells. Altogether a very useful little book, and a valuable addition to the Home University Library series.

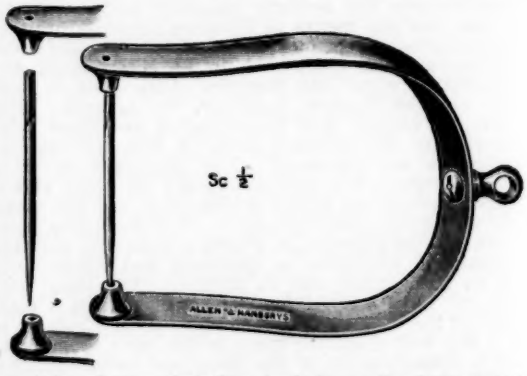
JOURNALS.

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY. September.—C. A. Gordon contributes the statistics collected by a committee of the Brooklyn Gynecological Society appointed to investigate all cases of Cæsarean section performed in the Borough of Brooklyn from 1921 to 1926. This was inspired by the investigation carried out in this country under the direction of Eardley Holland, whose results were published in the *Journal of Obstetrics and Gynæcology of the British Empire* in 1921. A total of 1805 cases are surveyed, and though no conclusions have been drawn from the data presented the figures, when combined with the British results, form invaluable material for those working on the subject of Cæsarean section.—H. Bailey, writing on the Long Labour, considers that acidosis is an important factor to be dealt with after a prolonged first stage of labour. Anæsthesia and operative interference should not be attempted until acidosis has been treated.—J. R. Goodall and M. Wiseman, discussing puerperal morbidity, lay stress on the importance of autogenous infection. Organisms present in the vagina or in the cervix are readily destroyed by antiseptics if they are not causing infection of the tissues, but if they are causing catarrh or erosion of the cervix antiseptics are almost useless. The writers advocate early treatment of chronic inflammatory diseases of the cervix as a means of reducing puerperal morbidity. In a paper by A. Mathieu and G. C. Schauffler on the Rigid and Stenosed Cervix during the First Stage of Labour, much emphasis is laid on the importance of fibrosis of the cervix as a cause of true primary cervical dystocia. These observers are dissatisfied with the evidence advanced by those who maintain that the cervix possesses a bundle of circular fibres of a sphincteric type. Delay due to failure of dilatation of the cervix is frequently diagnosed as spasmodic rigidity of the cervix. Usually delay is due to a misinterpretation of the severity of the pains or to voluntary inhibition of the contractions by a nervous patient. Non-dilatation is occasionally caused by syphilis, displacement of the os, adherent membranes, nipping of the cervix, carcinoma, and tuberculosis, but the commonest cause of true cervical dystocia is fibrosis of the tissues of the cervix resulting from chronic inflammation. The subjects of other papers include the Treatment of Asphyxia Neonatorum by the Injection of Alpha-Lobeline into the Umbilical Vein (R. A. Wilson); Primary Bilateral Carcinoma of the Fallopian Tubes (S. A. Wolfe); and Internal Rotation of the Head, with Remarks on the Kielland Forceps (F. P. McNalty). In the last paper the author maintains that the head rotates to the transverse position regardless of its original position. By traction with straight forceps such as the Kielland forceps, rotation should occur. If not, it can be assisted with safety.

New Inventions.

A SPRING CLIP FOR SKELETAL TRACTION.

THE employment of skeletal traction in the treatment of fractures has found a definite place in surgical practice. In the case of fractures of the leg, particularly if they are compound, transfixion of the tibia, and even of the os calcis, is undesirable on account of the risks of bone infection along the track of the pin. This troublesome complication is eliminated by the use of a supracalcaneal pin. It gives a good hold for



applying heavy traction and is easily introduced. I have had a spring horseshoe clip made to pass the pull to the traction apparatus as shown in the illustration, which is more convenient than Steinmann's clamp. The pin is passed through the skin between the posterior aspect of the ankle-joint and the tendo Achillis so as to lie on the upper surface of the posterior section of the os calcis. The use of a rigid pin is more satisfactory in practice than the Finochietto-Chutro stirrup because its use involves less liability to pressure on the skin, and its introduction under local or gas anæsthesia is simpler. The spring clip will also be found handy for holding pins transfixing the tibia or other bones.

The apparatus has been made in two sizes for me by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, W.

C. MAX PAGE, M.B., M.S. Lond., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, OCTOBER 27, 1928.

PUBLIC HEALTH AND LOCAL GOVERNMENT.

AT the close of his annual report on the state of the public health (summarised in another column), Sir GEORGE NEWMAN declares the principles which should guide the forthcoming changes in local government. The whole medical work of the poor-law, public health, education, factories and workshops, and insurance, should, in his view, be administered by one comprehensive local authority for the whole community in the area. The local authority will have its appropriate committees for securing the efficiency of the various public medical services; but, wherever there are health services to be administered from local rates, the responsibility must be concentrated in a single large-scale unit in each area. One striking feature of this programme is the proposed elimination of the poor-law guardians, and thus another chapter closes in the history of English institutions. From the time of Queen ELIZABETH the administration of the poor-law has been a conspicuous instance of English local government. In 1834 the parish was found too small a unit and was replaced by the poor-law union, the new boards of guardians being then created to take over the administrative functions of the overseers. It may be noted in passing that the consequential changes in the law were most imperfectly worked out both at that date and later in 1865 when all expenses of relief were charged upon the common fund of the union and ceased to be parochial charges. The resultant legislative confusion necessitated the consolidation and rewriting of the poor-law enactments last year; before introducing any proposals to change the law, it was essential first to make existing law intelligible. Nevertheless, however obscure the legislation in the middle of the eighteenth century, there could be little doubt in 1869, when the Royal Sanitary Commission was considering the formation of new local sanitary authorities, that the poor-law guardians would form the most appropriate unit for the purpose. Guardians existed everywhere in England; they were popularly elected and were representative; they had medical officers and were already undertaking some measure of sanitary services. They were a better choice than the vestry meeting or the highway board, and so Parliament selected them as the new rural sanitary authority.

This improvisation could not be permanent. The poor-law unions had been created in 1834 under a scheme which took account of the then existing market towns and the means of access and transport available. Far different conditions are visible to-day. For historical reasons each of the old poor-law unions has its own institutional premises; to-day some are almost empty and the medical facilities cannot economically be modernised. Meanwhile other authorities have been created with overlapping functions in the prevention and treatment of disease; the scope of public health services is being constantly enlarged; better coördination is seen to be necessary, and the community increasingly demands a higher standard. Just as in 1834 the parish as a unit was replaced by the union of parishes for poor-law purposes, so now the unions must be replaced by some larger formation for the purposes of public health. The historical perspective must not be forgotten at a time when a natural sentiment is manifesting its regret at the dethronement of the boards of guardians. For the medical profession the changes mean an increased opportunity of official service. Last year, says Sir GEORGE NEWMAN, there were 1662 local sanitary authorities and county councils in England with 1233 medical officers of health, of whom only 350 were whole-time officers. Thus the large majority of these local authorities relied for their medical staff work upon doctors mainly engaged in private practice, and, though it would be regrettable if the medical profession were rigidly divided into public and private practitioners, it may well be that the part-time medical officer of health is the victim of certain disabilities and is conscious sometimes of a divided allegiance. Year after year the responsibilities of medical officers expand and a more highly specialised training and experience are demanded. Efficient service means whole-time service in the conditions which exist to-day.

BACTERIAL SYMBIOSIS.

IT was, we believe, SHIPLEY who protested in his whimsical way that while we devote much of our time to the care of the malarial man we waste few thoughts on the sufferings of the mosquito. Prof. S. F. DUDLEY, in an address which we publish this week, asks us in similar vein to pity the poor pathogenic microbe. His avirulent brother, not to be distinguished from him in appearance, lives a quiet and uneventful life in the cavities of his host; smitten by the fates, or waywardly seduced by a Mendelian mutation, the pathogen commits hara-kiri in the very act of his virulence. True, he proliferates more freely; perhaps to him the crowded hour of glorious life is worth an age without a name in a bacteriological handbook. Prof. DUDLEY'S admirable paper is full of such apparent paradox; with CALMETTE he doubts the benefit to the herd of individual immunity; he shows the carrier to outnumber the afflicted. We are, no doubt, prone to forget that our contact with microbes is mainly by way of symbiosis. With almost all of the pathogenic forms compromise is possible. Even the *Entamœba histolytica* may play a passive rôle, and the streptococcus, potentially perhaps among the most virulent, is present in us all as an uninvited but unobtrusive guest—to the great benefit indeed of one class at least, the maker of vaccines. The value of these guests may be problematical, but many years ago Prof. L. S. DUDGEON advanced the view that the ubiquitous *Staphylococcus albus* provides antibodies effective against its yellow and more virulent cousin. Life without microbes is quite possible—at least, without organisms inside the living body. PASTEUR himself was doubtful on the point, and left the problem for later generations to solve—an exceptional restraint in one who solved nearly every problem he envisaged. The digestive tract of infants is sterile at birth; METCHNIKOFF stated that scorpions and certain worms do not harbour intestinal bacteria; fruit bats and polar bears are said to have sterile fæces. Tadpoles, goats, and hens have been reared in a bacteriologically sterile state. But, like the Fiji Islanders, such inhospitable folk suffer for their parsimony when the day of reckoning dawns and they are exposed to infection. It is perhaps as well that the search for the golden fleece of intestinal sterility has not yet found, among its many argonauts, a successful adventurer. There is, however, another aspect of bacterial symbiosis which deserves mention.

The microbe carrier is in the position of hotel keeper rather than private citizen; he cannot select his guests, and his cosmopolitan visitors may conspire among themselves. The symbiosis of microbes with each other produces problems of another order. KLEIN has shown how the virulence of the diphtheria bacillus is enhanced by the presence of streptococci. The influenza bacillus is rarely found in pure culture; and in artificial media it is often difficult to cultivate unless staphylococci are there too. The presence of other organisms is an important factor in the virulence of the anaerobic bacteria. True it cuts both ways; sprinkling the throat with staphylococcal cultures has been used in diphtheria with the hope, apparently well founded on occasion, that they may outgrow the more dangerous visitor, and cultures of the aciduric group are swallowed by those who desire to restrict their colonic flora. Nor must we forget the bacteriophage, even if we cannot classify it. In fact, to contemplate bacteria in terms of parasites only, and of isolated parasites at that, is to neglect many vital aspects of our dealings with the microbic world.

A NEW TEST FOR PREGNANCY.

ONE of the commonest, and at the same time often one of the most difficult tasks that fall to the lot of the medical man is the early diagnosis of pregnancy. There are few conditions which involve such deep-seated and complex changes with so little demonstrable effect. Some recent workers have put forward a test for pregnancy which is founded on a new principle—the presence of certain hormones in much increased amount in the blood and urine during pregnancy, and the demonstration of their presence by simple biological tests. These hormones are those of the ovary and of the anterior lobe of the pituitary. With the ovarian hormone the laboratory worker is now well acquainted; the proof of its isolation and action in promoting the growth of the uterus and bringing about œstrus in castrated female animals is complete. The nature of the anterior pituitary secretion is not yet quite so well defined. Since PIERRE MARIE in 1886 described the condition of acromegaly and observed that the disease was associated with tumours of the pituitary body, the nature of the effect of the anterior lobe on growth has monopolised the attention of scientific workers. Its interrelationship with the ovaries has long been suspected, however, and during the last two years has been strikingly confirmed by B. ZONDEK and S. ASCHHEIM in Germany and independently by P. E. SMITH and E. T. ENGLE in America. The hormone is supposed to act through the medium of the ovary, in which it brings about rapid growth of the Graafian follicles and in the immature animal may induce a premature œstrus. The work of A. C. SIDDALL and of ZONDEK and ASCHHEIM, which was reviewed in THE LANCET last week, is based upon the experimental proof of the increase in amount of these hormones in the blood and urine during pregnancy. SIDDALL'S work depends on the presence of ovarian hormone in the blood of the woman whose pregnancy is to be tested. Her serum is injected daily in doses of 1 c.cm. into an immature virgin mouse for six days. On the sixth day the mouse is killed and weighed and the ratio of the weight of the whole mouse to the combined weight of the uterus and ovaries is estimated. If the ratio is less than 400 to 1 the test is regarded as positive. In 142 cases examined nine were erroneous. It is during the early months or weeks of pregnancy that the test would be useful in practice, so that it is noteworthy that in 19 tests on women less than three months pregnant only one erroneous result was recorded. ZONDEK'S test depends on the assumption that the anterior pituitary hormone is the activating factor. It is present in traces in normal urine, but according to ZONDEK the commencement of pregnancy is quickly followed by an explosive production of anterior pituitary hormone which is excreted in the urine. If samples of the urine from pregnant women are injected into young female mice in suitable doses, and the mice are killed in five days, their ovaries show hæmorrhagic centres and corpora lutea. This phenomenon is said to occur also when an extract obtained directly from the anterior portion of the pituitary gland is injected, but not when urine from males or non-pregnant females is injected. The results obtained by ASCHUEIM, using this method, are remarkable. Of 258 control urines examined, four were positive, whereas of 197 specimens of urines from pregnant women only four gave a negative result. The validity must rest upon the confirmation of these experiments by other workers. If some biological test unconnected with the genital system for the presence of anterior pituitary hormone could be devised, the fact that this hormone is the activating substance would be even more clearly demonstrated. The Zondek test is thus of the utmost practical importance and it seems probable that in the near future it may be developed into a standard test which can be carried out with little trouble in any laboratory equipped for biological work, with only a very small chance of error in the results.

AN ANACHRONISM.

CONDITIONS of life on the banks of the Tyne are out of harmony with the times in which we live; they are an unwelcome legacy of the Victorian industrial era, presenting us with a medico-social problem extremely difficult of solution. The object of Dr. MESS'S survey of Industrial Tyneside [1] is to set out the chief facts concerning the welfare of the inhabitants of either bank of the Tyne estuary, an area which embraces 11 municipalities—on the north bank Newburn, Newcastle-on-Tyne, Wallsend, and Tynemouth; on the south bank Blaydon, Whickham, Gateshead, Felling, Hebburn, and South Shields—to which have been added for the purposes of the inquiry Gosforth and Whitley & Monkseaton, both of which are adjuncts of Tyneside though not actually riparian. The report, which has been drawn up under the guidance of an advisory committee presided over by Sir THEODORE MORISON, covers in separate chapters the questions of population, industries, ship-building, coal, housing, health provision, education, organised religion, voluntary social service, and local government; and the inquiry may be compared in importance with that undertaken for East London some 40 years ago by CHARLES BOOTH and his collaborators. There is, however, an essential difference, which is that Dr. MESS brings to his task the equipment of modern social research and the outlook of one trained in exact observation and deduction, for his monograph on Casual Labour at the London Docks still counts as a model investigation of its kind. The sordidness of the picture he draws seems to be only too clearly justified by an unbiased use of figures. Out of the mass of relevant facts he is nevertheless able to crystallise the Tyneside situation into a few pertinent questions. Can it be generally known, he

[1] Industrial Tyneside: a Social Survey made for the Bureau of Social Research for Tyneside, by Henry A. Mess, B.A., Ph.D. London: Ernest Benn, Ltd. Pp. 184. 10s. 6d.

asks, that Tynesiders live in homes smaller by 30 per cent. or so than those in which most Englishmen live; that the elementary schools are worse staffed than those in other areas; and especially that tuberculosis in Jarrow takes a toll twice as big as that which it takes in an average English town of that size? The Tyneside which he deplores is the product of a long period of prosperity, in face of which the natural tendency would be to say that nothing can be done just now, that the district must carry on as best it can till better times arrive. But for Dr. MESS and his committee there is no salvation in that direction; if Tyneside waits for the good old times to come back it may wait for ever. A badly housed, badly educated population is likely to be a miserable population breeding recklessly; Tyneside cannot afford to have such social conditions as now exist. The chief factor in the situation is that these small industrial towns are for the most part one-class communities.

Sixty or seventy years ago, writes Dr. MESS, when these towns were self-contained communities, men and women of all classes lived in them; they had their local gentry, their leaders of industry, their professional men, as well as their mechanics and labourers. It is different to-day. The lord of the manor no longer lives in the Tyneside town from which he draws his ground rents, or from the sale of whose land his wealth is derived; he or his descendants live in pleasanter places, and their connexion with the town is slight. The directors, the works managers, the secretaries, the chief engineers, and the chief chemists disappear when their work is done to homes at a considerable distance. The professional men, and quite a number of the better-paid workers, do the same. And whereas a great city keeps the different classes, though widely separated geographically and psychically, within the unity of its borders, here the well-to-do leave the poor workers at the yard gate and go home to another town and perhaps to another county.

The first ameliorative suggestion in the report is that some men and women should of free choice make their homes in the meaner Tyneside towns for the sake of neighbourliness, at all events until marriage and the coming of a young family make this difficult. There seems little doubt that more than a few would be willing but for the objection, not dealt with by Dr. MESS, that any who did so would be taking up housing room in an already overcrowded district, making it more difficult for at least one poorer neighbour who must live near his work and within his means. The report next appeals to the sense of responsibility among those in the higher positions of big industries. Useful welfare work may be done by one or other of these, but what the Tyneside towns need is something in the nature of an institute, a settlement, or a folk-house, to which all and every may belong. And, thirdly, there is the urgent need of a new equilibrium between population and industry; it may be a question of emigration, of migration to newer coalfields, of greater mobility between occupations, or of creation of new industries. The immediate situation may be black, but some comfort is to be derived from the experience of the past, for Tyneside has survived other crises during the last century.

Turning to aspects which more immediately concern the medical profession, Dr. MESS suggests the provision of additional infant welfare centres in some of the towns and especially more antenatal supervision, for infant mortality is not only high on the average, but is curiously unequal in its distribution. Maternal mortality, on the other hand, is definitely low, for it is a bright spot in the situation that so few married women leave their homes for industry or commerce. More institutional accommodation is required for advanced cases of tuberculosis in view of Jarrow's disturbing record of a death-rate from tubercle as high as it was 30 years ago. Nor have Gateshead and Wallsend yet recovered their pre-war position. More accommodation in local hospitals for cases of pneumonia would save many lives. The special hospitals in the district do valuable work, but are imperfectly related to each other and to the general hospitals, while the facilities for isolation are obviously deficient, and the poor-law hospitals are unable to classify their cases as they should. There is general testimony to the need of additional convalescent accommodation. While it may be necessary to wait for the initiation of large social changes, there seems no reason why it should not be possible even now to set up a permanent hospital council for Tyneside, the duties of which would be to review existing provision, to secure coördination by eliminating waste, and to endeavour to fill such gaps as have been shown to exist. Better still, perhaps, might be a council of broader scope, not restricted to the coördination of medical services alone, an urban counterpart of the rural community council. On Tyneside it is nobody's business to know what social agencies exist; there is no systematic attempt to train social workers. What is required is a recognised clearing-house to cover every side of social need. Reference to a handbook [2] just issued will show the many directions in which coördination is being attempted elsewhere. Something of this sort might bring Tyneside into the picture of the twentieth century.

THE WELFARE OF THE DEAF.

THE National Institute for the Deaf has, we are informed, received from an anonymous donor the sum of £5000 (consolidated 4 per cent.) to be applied in the promotion of the national objects of the institute. There are some 40,000 persons in Great Britain who have been deaf from birth or very early life, and the urgent need of larger provision for their welfare was clearly set forth at the annual meeting of the National Institute held in July last,[3] when Lord Charnwood, the Duke of Montrose, and Dr. F. E. Fremantle, among others, pointed out the grievous loss to the State, if only from the economical point of view, arising from inadequate provision for the deaf, and a resolution was passed calling upon the Government to deal with the matter at an early date. It is 40 years since any Government department has made an inquiry into the position of the deaf. The National Institute for the Deaf, which has been in active operation for only three years, has during that period done a great deal of useful work in spite of the fact that its hands are tied by lack of adequate funds, the ordinary income being insufficient to meet expenses. It is the only body competent to make a national survey of the many problems of deafness—our readers will note an appeal for information in our correspondence columns this week—and to initiate the necessary reforms, and we trust that other generously minded people will realise the urgent need for looking after our deaf population, and will follow the good example here recorded. The address of the National Institute is 2, Bloomsbury-street, London, W.C. 1.

[2] Voluntary Social Services: a Handbook of Information and Directory of Organizations. London: National Council of Social Service, 26, Bedford-square. Pp. 198. 2s.

[3] See THE LANCET, July 21st, p. 155.

Annotations.

"Ne quid nimis."

RHEUMATISM AS A NATIONAL PROBLEM.

THE recent meeting of the International Society of Medical Hydrology, which took the form of a roving commission through the various British health resorts, may well be a landmark in the history of spa treatment. It was not only that foreign delegates in great number were introduced to an admirable variety and wealth of hydrological equipment under the most pleasant conditions of weather and company, but that the resorts themselves must have had brought home to them a salutary sense of being part and parcel of a national and international movement. At each stage of the journey subjects of great medical interest were discussed by clinicians of European reputation, and plans made for further study and research. In one direction these prospects seem likely to be realised within the near future, for at Buxton on Oct. 15th an International League against Rheumatism was duly constituted. It was there that Dr. Zimmer, representing the German group, pointed out that the incidence and cost of rheumatic diseases throughout the German Republic constituted a blot on the national life more serious than tuberculosis itself, and the reports from nine different European States, read at this meeting, expressed the same feeling in different ways. In the prevention and treatment of tuberculosis everyone now recognises the value of an organised campaign and the justification for State aid, but although the Bath Conference of May last ranged over a very wide field of medical and social problems in regard to rheumatism, it produced no immediate result in the form of a concerted movement for dealing with these problems. Speaking for the General Federation of Trade Unions, Mr. W. A. Appleton stated at Buxton that 18,000 weeks of treatment, with consequent loss of working time to the community, were imposed by the rheumatic diseases on any group of 100,000 trade-unionists. Any reduction in this great mass of invalidity would save the resources of approved societies and secure an increased working balance on insurance funds. It seems not unreasonable therefore to suggest that some of the cost of treating and preventing rheumatism should be regarded as one of the contingent liabilities for which the reserve fund of the approved societies has been built up. The question of financial support from the State is exactly parallel to the case of tuberculosis. With this large policy in sight the British Subcommittee on Rheumatism has done well to follow the example of the continental States by re-forming itself on a wider basis as a national committee or society for organising research, control, and treatment of rheumatic diseases. We understand that the first meeting of this committee will be held on Nov. 7th, when it is hoped to have full official representation. After that it should not be long before every county has its rheumatism officer and every great centre of population its rheumatism clinic.

CURRENT PROBLEMS IN TUBERCULOSIS.

THE annual conference of the National Association for the Prevention of Tuberculosis, which is usually held in July, was postponed until October this year in order to facilitate the presence of transatlantic colleagues who had been attending the conference of the International Union against Tuberculosis at Rome. For this reason the conference in London had more than usual importance, which was reflected in the choice of subjects for discussion. The first day was devoted to a conference on tuberculosis among primitive peoples, and the second to the principles underlying antituberculosis schemes in any country. A report of the discussions finds its conclusion on p. 865.

The lessons of the conference may be summed up in Prof. S. Lyle Cummins's remark that within a few generations we should either be guilty of the deaths of numbers of subordinate people from preventable disease, or else provide them with working conditions consistent with their health. There would seem to be little doubt that all civilised nations have now awakened to their duties and responsibilities in this matter. The Health Organisation of the League of Nations, too, whose work in all branches of preventive medicine deserves to be more widely known than it is, is fully alive to these questions. Between the completely unprotected aboriginal and the well-salted European there appear to be many stages of partial immunisation. The older civilisations of the East, for instance, possess an amount of immunity which is by no means negligible, whilst Dr. R. G. Ferguson, of Saskatchewan, related to the conference how tuberculosis among the Indians of the great Canadian plains was gradually assuming a more chronic character. In South Africa, too, a considerable degree of adaptation and resistance has been now reached, thanks largely to efforts made amongst its native workers by the gold-mining industry. The stages of this immunisation have been marked, not by finding a therapeutic remedy for tuberculosis or by any prophylactic vaccine or serum, but by the patient efforts of preventive medicine directed by the men on the spot. Prof. Cummins described, for instance, how the dark overcrowded compounds of the workers, perhaps no worse than the native kraals but disease producing nevertheless, have given place to a new type of compound with a generous allowance of air-space and ventilation. It is perhaps not too much to hope that the purdah system of India, to which Dr. A. C. Lankester attributed a large responsibility for tuberculosis in that country, will in due time give place to a healthier environment for Indian women. But there is still a vast amount of acute and generalised tuberculosis amongst the unprotected people of the world which for pathologists and immunologists throws a flood of light on infectivity and resistance, on initial infecting dose, and on portals of entry—first a period of complete generalisation of infection in adults, such as is seen in the generalised tuberculosis of the infant in Europe, and later a less acute form comparable with the adolescent tuberculosis of Europe, until slowly the age at death shifts to the later years, a sign that immunising forces are beginning to take effect.

In the second day's discussion at the conference on the principles underlying the antituberculosis campaign, two points were stressed by Sir Robert Philip—namely, the great frequency of childhood infection and the importance of after-care; "once infected the individual," he said, "may, and often does, remain under the influence of infection all his days." To these might be added a third factor, which does not appear to have been emphasised as heavily as it might—namely, the importance of the chronic pulmonary case which is to all intents and purposes a carrier. Early diagnosis is doubtless of vast importance, but we must face the fact that modern methods of treatment have lengthened the life of the chronic phthisic, and in lengthening life have indirectly often lengthened the period of his infectivity. Of all the questions of preventive medicine which harass the tuberculosis physician to-day probably this is the most difficult, what to do with his case of chronic pulmonary tuberculosis who becomes afebrile and able to, and desirous of, returning to the outside world of human beings, but who still expectorates sputum containing tubercle bacilli. Finally, there are the questions of administration and control which were so clearly emphasised to the conference by Dr. G. Lissant Cox, of the Lancashire County Council. We wish it were possible, as he suggests, to make a regional survey of tuberculosis in this country on the lines of the illuminating survey made at Framingham in America. The financial side alone seems insuperable at present, at any rate for any survey on a large scale. But this should not dis-

courage the individual worker. If example is better than precept, the valuable work done on the lines of social inquiry on Tyneside during the last few years may be quoted as encouragement.

HOSPITAL EXPENDITURE.

THE Statistical Report [1] for the year 1927, just issued by the Economy Committee of King Edward's Hospital Fund for London, will be found indispensable to all who are concerned with hospital management. As we are reminded in a prefatory note, the annual statistical survey was begun by the late Mr. J. Danvers Power, who dealt in 1903 with 16 hospitals, but the early reports were circulated privately as they contained confidential matter. The first public report appeared in 1909, when figures were given for 66 hospitals. In 1910 the report was extended to cover 99 hospitals, and in 1922, when an analysis of the general fund income was added to the report, which then included 113 hospitals. The present series began with last year's report which covered 134 hospitals, as against 136 this year. The number of hospital beds available in 1927 was 15,040, as compared with 13,640 in 1923, the average number of beds occupied being 12,430, as compared with 10,960. New in-patients numbered 212,100, as compared with 175,100 five years earlier, and for the same periods the new out-patients were 1,670,000 and 1,514,000 respectively. The total out-patient attendances in 1927 were 7,902,000 and 6,669,000 respectively. It should be noted that the total for 1927 does not include the out-patients at the Plaistow Maternity and Mothers' (Salvation Army) Hospitals, as early figures are not available for comparison. All this shows a steady increase in the volume of hospital work. The total income of these 136 hospitals for the year under notice was £3,241,000, as compared with £3,041,000 in the previous year, the increase being due in the main to donations, legacies, and receipts from patients, the latter totalling £66,000. It is satisfactory to note that the set-back in 1926 has been more than overcome, the 1927 figures recording a new high level in income. The report, which in an appendix contains figures relating to six infant welfare hospitals, is elaborately illustrated with graphs and diagrams which, generally speaking, make for clearness. A novel diagram is a medicine bottle showing the total general fund expenditure, and the proportion of this expenditure provided by income from investments and by receipts for service during each of the five years 1923–27, an uncoloured portion of the bottle illustrating the gap which needs to be filled by voluntary gifts. In 1927 the expenditure on London voluntary hospitals was rather more than £8500 a day, to meet which something over £4000 a day must be raised by gifts.

THE WISDOM OF PETER HARDING.

SOME years before the late war Dr. Peter Harding wrote a series of letters from "the corner of Harley-street," which ranged wittily over a variety of subjects—fishing, the leanings towards quackery of an old aunt, the teaching of sexual matters to the young, education, and modern journalism, and above all the worries, the pleasures, the rewards, the duties and the glories of the medical profession. We recognised at the time that in these letters Dr. H. H. Bashford, as we now know him, had written a remarkable manual of wise professional conduct. In one letter he recognises with great sympathy the descent for the young physician from holding the office of house physician or surgeon to being a young general practitioner, shorn of the panoply of office and presenting himself as a visitor—probably an unwelcome visitor—in unfamiliar circumstances. Many a man in the early stages of his employment, when he is likely to feel both naked and ashamed, will find counsel and support in the letters of Peter Harding. More shrewdly than most writers he estimates the qualities which distinguish the successful practitioner; he may not be able to excise a Gasserian ganglion, he may not know very much about the researches of Calmette or Pirquet, but he does know precisely when to call in the men who do. When sickness comes to the average household it touches nearly every department of domestic economy, and upon a hundred points other than that of pure medicine the general practitioner is the trusted adviser. His patients and their friends do not appeal to him definitely either as a moralist, as a sanitarian, or as a wizard; they are simply involved in terrible complications, and they call upon him in a general manner as a very present help in time of trouble. Peter Harding's letters, now republished in a cheap and handy edition,[1] have not lost in value with the intervening years of strife which have put so many of the old prudential considerations out of date. The "blobs" and "half-masters" which distinguish his adolescent girls are no more, but the advantage of abstinence from butterscotch over the wearing of a flannel cholera belt, the counsel to the aunt to rub a few drops of turpentine over the spot rather than take the pills which so well suited one of her friends, are as topical as they were; and the interview with a young journalist in Chapter XXII. might have been written for situations which have since led to ethical disaster. The book is pervaded with a humour, whimsical rather than mordant, which should help the reader to face alike the tragedy and the pathos of professional life. No novice can read Peter Harding's letters without gaining an insight into the actions and reactions of practice which should enable him to begin to form a philosophy of professional life. No practitioner of experience who lives in this spirit will need to blunt his perceptions or to soothe his sorrows with artificial anodynes. Peter Harding will, in fact, if taken to heart, enable him to falsify the picture of professional life recently sketched in lurid colours at the Institute of Hygiene.

INFECTIOUS DISEASE IN IRELAND.

IN an address on the epidemiology of Ireland, published in the *Irish Journal of Medical Science* for October, Sir John Moore says that the first recorded pestilence in that country was chronicled by the Four Masters as taking toll of 1000 people in a single week in the year 2820 A.M. (Septuagint chronology). Their burial-ground or Tamhleacht (literally, the plague monument) can be traced in the town now called Tallaght, near Dublin. Bills of mortality in the capital date from 1682, and valuable epidemiological observations began to appear early in the eighteenth century. Among the outstanding writers were Joseph Rogers: "Essay on Epidemic Diseases," 1734; John Rutty, "A Chronological History of the Weather and Seasons, and of the Prevailing Diseases in Dublin, with their Various Periods, Successions, and Revolutions, during the space of Forty Years," 1770; and James Sims, "Observations on Epidemic Disorders, with Remarks on Nervous and Malignant Fevers," 1773. The epidemic diseases discussed were "influenza," "fever," "small-pox," "dysentery," and "epidemic angina maligna." This last was diphtheria, and it is probable that "dysentery" was often enteric. The severe frost of 1739–40 destroyed the potatoes and caused famine, which ushered in a calamitous train of dysenteries, malignant fever, small-pox, and scarlatina maligna, as well as an "unparalleled epizoötic affecting sheep and horses." It is supposed that 300,000 people perished. Thrice in the nineteenth century did cholera visit Dublin; in 1832 it carried off 5632 persons, in 1849 the victims numbered 30,156, and it appeared again in 1866, when Sir John Moore was a medical student. In the Registrar-General's report for August 26th, 1865,

[1] London: Spottiswoode, Ballantyne and Co., Ltd. 108 foolscap pages. 2*s*. 6*d*.

[1] The Corner of Harley Street. By H. H. Bashford, M.D. London: Constable's Miscellany, No. 26. Pp. 271. 3*s*. 6*d*.

are the words: "I suggest that this would be the time for (sanitary) inspection from house to house; for if (cholera) breaks out in the neglected tenements of the poor, it will, no doubt, attack the inhabitants of the better houses which may happen to be in the neighbourhood of the tainted atmosphere." Exactly seven months later the first death from cholera was recorded and the epidemic did not cease until it had destroyed 1459 citizens of Dublin in 22 weeks. Typhus has not troubled the island since the great famine epidemic after the failure of the potato crop in 1846, and although terrible epidemics of small-pox occurred in 1871, 1878, and 1894, and a small outbreak in 1903, only one death from this cause has been registered in the whole country during the last quarter of a century. No conscientious objection to the Vaccination Acts is recognised in Ireland. Sir John Moore passes, in this Presidential address to the Epidemiological Section of the Royal Sanitary Institute, from the historical epidemics to the happier theme of the growth of sanitary science, a movement which is mostly contained within his lifetime and in which he has played a distinguished part. A diploma of State Medicine was instituted in 1870, and in 1872 the Dublin Sanitary Association was formed. The first Irish Public Health Act, passed in 1878, consolidated a score of minor measures already in force. After praising famous men and women who laboured to accomplish all that has been done, he concludes by speaking of the five infections still rife—measles, scarlatina, diphtheria, pneumonia, and epidemic diarrhœa—and to the ever-present problem of housing and slum clearance. Every friend of Ireland will hope with him that she may soon learn how to deal with these enemies of her peace.

THE RISKS OF INDUCING PNEUMOTHORAX.

THE risks attending the induction of artificial pneumothorax are small, and, as was once more made evident in the discussion reported on p. 867, in properly selected cases the therapeutic value of the procedure is high. Much has been written on the dangers of pleural shock, but this is a complication that may result from any form of pleural puncture, and one more likely to be encountered in the later stages of treatment than at the time of the primary induction. Details of technique are of the utmost importance if untoward sequelæ are to be avoided, and Dr. R. R. Trail's suggestion that facilities should be offered to practitioners to study the exact proceeding used in sanatoriums deserves attention. The dangers of gas embolism are negligible if a trocar similar to that invented by Dr. Clive Riviere is used and if the air is allowed to enter the pleural cavity under the influence of its negative pressure alone. Surgical emphysema is usually regarded as a minor accident, and seldom causes distress to the patient or anxiety to the practitioner; but two cases published recently by H. Secousse, J. Caussman, and P. Lamothe[1] illustrate the grave danger that may attend the escape of air into the subcutaneous tissues. In the first of the two cases described the attempt to induce pneumothorax was abandoned after two punctures, no free pleural space being found. Subcutaneous emphysema was noticed a few hours after the punctures had been made, and next day the condition spread to the face, neck, and arms. Despite treatment by multiple skin punctures the emphysema spread to involve the subcutaneous tissues of the whole body, including the legs and feet. The patient died of asphyxia four days after the onset of symptoms. In the second case, after three unsuccessful attempts to find free pleura had been made, a fourth trial led to the discovery of a pleural pocket into which 100 c.cm of air was passed. A rapid rise in pressure was noticed, the patient complained of pain, and the operation was abandoned. Subcutaneous emphysema was noticed on the evening of the same day, and on the morrow this had spread to involve the whole thorax, face, and arms. The condition gave rise to acute pain. During the following week the emphysema gradually subsided. The common cause of subcutaneous emphysema following artificial pneumothorax is the escape of injected air from the pleural cavity by way of the track of the needle and the resulting emphysema is usually limited to the environs of the puncture. In the two cases reported it is obvious that the escape of pulmonary air was responsible for a condition causing serious distress to one patient and the death of the other. An adherent and rigid pleura was present in each instance. The needle passing through this punctured the lung and the track remained patent owing to the lack of normal elasticity; thus with each expiration air was forced into the subcutaneous tissues. Accidents of the nature described are fortunately rare, but the possibility of a similar mischance should be kept in mind, especially when physical signs or radiographic appearance indicate a thickened and probably adherent pleura. If care is exercised to avoid "silent" areas and to limit the depth of puncture the risk of penetrating the lung is not great. Such risk is materially lessened by the use of a needle of the Riviere type, and will be still further reduced if a careful technique be adopted to ensure so far as possible the closure of the puncture track. This may be accomplished by keeping the skin flat at the moment when the needle is withdrawn, and by applying a pad over which pressure is exerted by the patient's arm for a few minutes after the operation. Should any danger of extensive emphysema arise the authors suggest the subcutaneous insertion of Southey's tubes. A more drastic remedy is that practised by Beranger, who in a case of surgical emphysema exposed the trachea and inserted drainage-tubes into the surrounding tissues to permit the escape of effused air.

[1] Archives Médico-Chirurgicales de l'Appareil Respiratoire. 1928. Tome III., No. 1.

THE ROCKEFELLER FOUNDATION AND MEDICAL EDUCATION.

ALTHOUGH the work of the international health division is probably the most important of the Rockefeller Foundation's activities, especial attention will be given in this country to the section of its annual report which deals with medical education. Visits have been paid by the staff to educational institutions in many countries and prominent "medical educators" have visited Canada and the United States as guests of the Foundation during 1927. Fellowships in medical education have proved a valuable part of the work of the Foundation, being awarded by preference to young physicians connected with hospitals or schools with which the Foundation is already coöperating. On the recommendation of their teachers and with the promise of assured positions in these institutions on the termination of their Fellowships these men take their country's point of view to foreign schools and bring back a new outlook that will help in their career as instructors and investigators. Excluding certain special grants to Fellows from China, the Foundation awarded 111 foreign Fellowships in 1927 and continued to support the Fellowships administered by the Medical Research Council in this country for study in the United States. The programme started in 1925 for recruiting the ranks of teachers and investigators, by assisting in a small way departments which are active in attracting and training young medical graduates, has been carried on. Aid in furnishing laboratory supplies as an emergency measure in Europe after the war was discontinued at the end of 1926. In 1927, however, a new programme was undertaken to help in re-establishing returned Fellows by providing them with necessary laboratory supplies for going on with work along the lines laid down whilst they held Fellowships. Grants to aid in the provision of medical literature are gradually being diminished in view of a decreasing need for such assistance, but in 1927 literature was still supplied to as many as 260 institutions in 19 countries. Under the heading of aids to

medical institutions the report of the Foundation describes some of its biggest individual efforts. At Lyons there is to be a contribution towards the purchase of land and the cost of construction of a building to house the Faculty of Medicine and Pharmacy, next to the site of the large new hospital which the municipality has been building. At Tokio, the Keio University Medical College has received funds to provide an earthquake- and fire-proof building and for equipment for new laboratories of hygiene and parasitology, whilst another new undertaking in 1927 was aid to the National School of Medicine and Pharmacy at Port-au-Prince, Haiti. In this country the work of the Foundation is of course well known. The help given to the London Hospital and Medical School for the unification of the pathological laboratory and other laboratories of the hospital made it possible to open new buildings not long ago, and at University College the Foundation has provided endowment for the increased maintenance costs in the departments of anatomy, physiology, and pharmacology.

A CENTENARY AND A CONGRESS IN EGYPT.

THE Kasr-el-Ainy Hospital is one of the many legacies of Napoleon's adventure in Egypt, for it was converted from a palace into a hospital in 1798 by his director of medical services, the famous Baron Larrey. Rebuilt in 1812, it later became the first Government medical school in the country, and the centenary of this school, to be celebrated in December, will be an event of importance to Near Eastern medicine, because King Fuad will then lay the foundation-stone of new buildings on Roda Island. These will comprise a hospital of 1500 beds, and large schools of medicine, dentistry, and pharmacy constructed to the plans prepared by Messrs. Nicholas and Dixon-Spain of London. This immense medical centre is the first item of the Egyptian Government's programme for increasing hospital accommodation, and the centenary celebrations will gain in prestige and interest from the presence in Egypt of an International Congress of Tropical Medicine and Hygiene which is to meet in Cairo from Dec. 15th to 22nd. This congress promises to be exceptionally successful, for nearly 1500 members have already arranged to be present, and there will be a full week of scientific meetings. At its conclusion members will be able, if they wish, to spend Christmas at Luxor under conditions which are described as ideal, and we learn that they will benefit by substantial reductions in steamer passages, railway fares, and hotel charges. The arrangements for travel and excursions have been entrusted to Messrs. Thomas Cook and Son, to whom application may be made at their various offices; or, if so desired, the committee will undertake this work for members. The secretary-general is Dr. Mohammed Khalil, who may be addressed at the Faculty of Medicine, Cairo.

DIABETES AND PREGNANCY.

REVIEWING the results of treatment for diabetic women who have become pregnant, Mr. A. L. Walker [1] says that 19 cases of diabetes mellitus with pregnancy have been described during the last six years. This shows that the condition is very rare, but it is none the less important, if only because the recorded cases give a good idea of the value of insulin. Before this substance was available Whitridge Williams collected a series in which 18 out of 66 patients died during pregnancy, labour, or puerperium—a mortality of 27 per cent. Insulin seems to have changed the outlook altogether, for Walker states that only one of the 19 recent cases was fatal, and she had suffered from a severe toxæmia of pregnancy. Furthermore, only two of the other patients seem to have lost ground during their pregnancy, and one of these got better again later. The figures for the children also show considerable improvement on the mortality of 41 per cent. recorded by Whitridge Williams. If we add to Walker's series the case which Dr. N. M. Goodman reports on p. 862 of our present issue, we find that the 20 women had 23 pregnancies, and that 17 children were born alive. There were four still-births and one woman had two miscarriages, so that the total mortality of children was only 26 per cent.

These results are so good that the inference might be drawn that a diabetic woman runs little risk in becoming pregnant, and Goodman's case shows that the issue may be satisfactory under conditions which would be considered unfavourable. But this inference would be wrong, for conception always exposes the patient to the risk of developing some complication during the pregnancy, labour, or puerperium. If the diabetic woman gets any complication she will need more insulin; she may be in grave danger of her life unless the dose is rapidly increased, and on recovery she may require more insulin than before. Nevertheless, provided the patient and her husband know the risk which is being run, there is no reason why the pregnancy should not be permitted. In considering the treatment to be adopted it may be noted that in two cases the child was delivered by Cæsarean section so as to sterilise the woman. The question whether sterilisation should be performed must be very carefully considered, and it should only be done at the explicit request of the patient and husband. Both male and female diabetic patients often ask whether it is certain that a child born of a diabetic parent will be a diabetic. So far there are no data available to answer this question, and it is only possible to express the opinion that it has a greater chance of developing diabetes than a child of a non-diabetic parent, though it does not follow that it will do so. None of the children of Mr. Walker's series had any signs of diabetes at birth, and so far no accounts of their fate have appeared. The various authors who have reported these cases should certainly report any future developments so that facts may be available instead of impressions.

[1] Jour Obst. and Gyn. Brit. Emp., 1928, xxxv., 271.

HALLOWEEN, 1828.

ALLHALLOWS Eve marks one of the most ghastly of medical memories, for it was on this night a hundred years ago that Burke and Hare committed their last murder. Though the story has often been told,[1] the occasion demands a brief repetition. Burke and Hare had a short run of less than a year; 15 murders were committed without suspicion of foul play, but the sixteenth was brought to light, and they and their accomplices were arrested and tried for their lives. Hare and his wife turned King's evidence, Burke was hanged and dissected. The murders began in this way. On Nov. 29th, 1827, an old army pensioner died in Tanner's-close, West Port, Edinburgh. He was in debt to his landlord, Hare, to the amount of £4. Hare decided to reimburse himself by selling the body. It was removed from the coffin and a bag of tanner's bark substituted; after the funeral of the bark Burke and Hare went to the University intending to bargain with Monro (tertius). While they were inquiring for Monro's rooms one of Knox's students happened to pass by and suggested that they should try Knox's rooms at 10, Surgeon's-square. This they did, and Knox bought the body for £7 10s. Here was an easy way of making money; too lazy to undertake the hard work of the resurrectionist, and finding it tedious waiting for another natural death at home, Hare suggested enticing the aged and infirm into his house and doing them in. Their first case was an old woman market-fresh from Gilmerton, near Edinburgh. Hare got her into his den, gave her more whisky, and when she was dead drunk, he placed his hands firmly over her mouth and nose to stop respiration, while Burke laid himself across her body to ensure stillness. The body brought £10.

[1] See, for instance, a leading article in THE LANCET, 1921, ii., 190.

Encouraged by the success of the experiment, Burke and Hare lured into their houses widows, orphans, street-walkers, and imbeciles, made them drunk and suffocated them. Daft Jamie and bonny Mary Paterson were well-known Edinburgh characters, and the fact that the bodies were often warm when delivered at the rooms does not seem to have aroused any suspicion. Their last victim was a woman named Docherty, who was invited to partake of the revels of Halloween, and when drunk was murdered in the usual way. Next morning her body was seen by two lodgers under some straw, and the police were informed. We need only refer to the abuse which was showered on Knox and his assistants; the press of the day roundly asserted that they knew too much, and called for an inquiry into the whole matter of the bodies dissected at Knox's rooms during the past year. Although this odium now appears to have been entirely undeserved, Knox's career as a great teacher of anatomy was practically over. His assistants, the chief of whom were Wharton Jones, William Fergusson (later Baronet and President of the Royal College of Surgeons), and Alexander Miller, shared in the abuse. We have Sir Rickman Godlee's authority for stating that Wharton Jones felt the reproaches most keenly; it was a tragic period of his career, and he never alluded to it in after life if he could help it. The passing of the Anatomy Act of 1832 was the outcome of these villainous murders. The whole country was roused to frenzy. The Government, though often urged by responsible persons to do so, had up till then resolutely declined to make any provision for the teaching of anatomy. But the Burke and Hare murders led to the crisis which, four years later, was settled for good and all by an Act of Parliament.

SUBSCRIBERS and donors to the Royal Medical Benevolent Fund are asked to forward their subscriptions for the current year before Dec. 31st. Not only the scope of the Fund's work but also the amount of assistance given depends upon the subscriptions received, and in view of the many cases in which help is greatly needed, especially during the winter months, an urgent appeal is made for donations. The work which is being undertaken is illustrated by a brief report appearing on p. 856. Cheques may be sent to the hon. treasurer at 11, Chandos-street, Cavendish-square, London, W. 1.

DONATIONS AND BEQUESTS.—As a memorial to her late husband, Dr. Filippo G. Melandre, who worked for 35 years on the hospital staff, Mrs. Melandre has provided an installation of an X ray apparatus for the new X ray department of the Italian Hospital, Queen-square, W.C., at a cost of £1000.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At 5 P.M. on Monday, Oct. 29th, at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., Mr. C. S. Lane-Roberts will give a lecture on Abdominal Pain in Pregnancy. On Tuesday, Oct. 30th, at 2 P.M., Mr. Lionel Colledge will give a clinical demonstration at the Hospital for Diseases of the Throat, Golden square, and on the following day, at 4 P.M., Dr. S. H. Daukes will give a demonstration on Diet and Disease at the Wellcome Museum of Medical Science, 33, Gordon-street, W.C. No fee will be charged for admission to the lecture or demonstrations. On Monday, Oct. 29th, a practitioners' course in medicine, surgery, and the specialties, lasting a fortnight, will begin at the Hampstead General Hospital. It will consist of a demonstration and lecture daily from 4.30 to 6 P.M. Other courses which have been arranged are as follows: Medicine, surgery, and gynæcology, at the Royal Waterloo Hospital, Nov. 12th to Dec. 1st; neurology, at the West End Hospital for Nervous Diseases, daily at 5 P.M., Nov. 19th to Dec. 15th; ophthalmology, at the Royal Westminster Ophthalmic Hospital, Nov. 12th to Dec. 1st; proctology, at St. Mark's Hospital, Nov. 12th to 17th; urology, at St. Peter's Hospital, Nov. 19th to Dec. 1st; venereal disease, at the London Lock Hospital, Nov. 5th to Dec. 1st. Syllabuses and particulars of post-graduate work may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXVI.

THE TREATMENT OF GASTRIC AND DUODENAL ULCER AFTER SUBSIDENCE OF ACUTE SYMPTOMS.

THE treatment of peptic ulcer at the time when the patient first seeks advice on account of its manifestations has already been dealt with in this series, and some indication has been given as to the method of treatment at a later date. It is a common experience that a very little trouble is sufficient to allay the outstanding symptoms of this disease, but it is frequently found that patients relapse in spite of the apparent success which followed their original treatment. If a case of gastric or duodenal ulcer is to be successfully treated, it is clearly necessary that the patient shall not only be freed from pain, hæmorrhage, or any other symptom, but that he shall be kept in good health subsequently. One of the outstanding features of this common disease, or diseases, is the periodic nature of its exacerbations, and it is exceptionally rare to encounter a case in whom attacks have not occurred for several or many years previously.

Careful inquiry into the history still further elucidates the fact in the majority of cases that between attacks a patient has had periods of complete good health. Bearing this in mind, no physician is justified at a time when this patient has been rendered free of symptoms for some weeks in imagining that he is cured, or, indeed, anything like cured. If permanent cure is sought, it is precisely at this period when the patient has been free of all symptoms for several weeks or months that curative treatment must be most actively pursued.

The stomach and duodenum could almost be described as silent organs, for there is little doubt but that they will function without the production of any abnormal symptoms at times when in reality they are the site of considerable anatomical change. In other words, the absence of symptoms is never any sure indication that the ulcer has disappeared, and it may be taken as an axiom that the presence of pain with gastric or duodenal ulcer is a late, and not an early, manifestation of the disease, and similarly that the disappearance of pain is an extremely misleading sign if it is interpreted as indicating the healing of an ulcer. To secure permanent healing a four-fold plan must be followed. This includes: (1) periodic review; (2) radiographic and laboratory control; (3) dietetic measures; and (4) treatment by drugs.

(1) *Periodic Review.*

The failure of many cases to avoid relapses is frequently due to the medical adviser not having impressed upon them the necessity for prolonged treatment, and is still more frequently due to a patient having neglected to follow sound advice when it has been given. Such failures can frequently be avoided by a re-survey of the case at regular intervals, at first monthly and, subsequently, every three or six months. It is probably in the interest both of the patient and of his regular medical attendant that such periodic overhauls should take the form of a consultation. It must be remembered that these patients are usually in apparently good health, but that breakdown is likely to follow unless they are continuously encouraged and impressed with the necessity of prolonged care. They are the victims of a disease which only manifests itself at a time when it has become serious, and it must be made plain to them that to secure permanent healing of a gastric or duodenal ulcer is no less difficult a task than to secure the permanent healing of such a lesion as a chronic ulcer on the leg.

At the first re-survey of a patient whose acute symptoms have subsided particular attention should be directed to the elimination of focal sepsis. Until such potential causes of embolic trouble have been eliminated no one can claim to have taken the steps necessary to prevent recurrence of ulceration. It is frequently inexpedient to press drastic dental treatment on a patient at a time when there are effects of acute ulceration with risk of hæmorrhage and perforation, but as soon as his general health is more or less restored such treatment should not be postponed if indicated.

(2) *Radiographic and Laboratory Control.*

(*a*) *Radiographic Examination.*—Radiographic examination of the stomach and duodenum can be carried out first at six monthly and later at yearly intervals. It is to be remembered that the disappearance of an ulcer crater is not evidence of permanent healing, and that early ulceration will occasionally be invisible to the X rays. Complete absence of symptoms and of radiographic signs is valuable evidence of a negative character. The recurrence of symptoms or of radiographic signs which had previously been absent is positive evidence strongly in favour of recurrence.

In the case of duodenal ulcers of any real severity it is rare for the X ray evidence of anatomical deformity ever completely to disappear, but perfect health for an indefinite and comparatively permanent period is compatible with a considerable degree of scarring and permanent deformity in this situation.

(*b*) *Laboratory Examination.*—Examination of the stools for blood should be carried out at three monthly intervals after all symptoms have disappeared. It is unnecessary to put the patient on a special diet for this examination, but should occult blood be reported present, the patient should be put on a hæmoglobin-free diet for a few days and the examination repeated before significance is attached to it.

The above measures may well be made part of the periodic review and are of very great assistance not only for elimination of evidence of grave disease, but also as a means of impressing on the patient the necessity for patience and caution.

(3) *Dietetic Measures.*

It may be assumed that we are dealing with a case who has been carefully treated for three or four weeks on the lines indicated by Sippy—i.e., that he has been on 1–2 hourly feeds, largely consisting of carbohydrate and fluids, with a certain number of eggs, that he has begun to take a little fish once or twice daily, and that he is entirely free of symptoms. The diet of such a case for the next two years at least should be planned on the following lines. He will take three light meals daily, and the period between these meals will be broken by feeds to be taken at intervals of not more than two hours—i.e., he will take a light breakfast, a feed in the middle of the morning, and a light lunch not later than 1 o'clock, two feeds between then and a light dinner, which meal should not be later than 7.30 P.M. A final feed at 9.30—10 P.M. is appreciated by many patients.

Breakfast.—This may consist of one or two lightly cooked eggs, crisp toast or breakfast rusks, butter, honey, jelly, or jelly-like marmalade. Milky tea or coffee, one cup. A little porridge may be taken with advantage at breakfast if the patient cares for it, and cream should be taken either with this or in the coffee. If porridge is taken one egg should be sufficient.

Lunch.—Soup, either thick or clear, but not containing anything which would not pass through a coarse sieve is probably the ideal form of food for such patients. It is, however, not easily available in this country. Instead, for purposes of convenience, it is best to recommend a small helping of fish of soft character, cooked in such a way as not to deprive it of its softness, and to be taken with mashed potato. Mashed potato should not be the sodden abomination of the usual English restaurant or boarding-house, but should be made from floury potatoes, with plenty of milk and butter. It should have the consistence of thick whipped cream, and when properly made is delicious. The second course should consist of milk pudding, junket, or baked custard with cream and sugar.

Dinner should be on the same lines as lunch, but at this meal soup is almost invariably available. Its calorie value is increased by the addition of potato flour or other thickening, together with some butter or cream, and dry toast may be taken with it. Subsequent courses may be similar to those taken at lunch.

Feeds.—These may consist of milky coffee (usually the most popular), Horlick's malted milk, Ovaltine, Glaxovo, milky cocoa, tea and biscuits, egg and milk, or milk. Cold milk is well tolerated by some patients, but in others tends to produce trouble through the firmness of the clot. Citration of the milk will prevent this, but it may be less troublesome to use a substitute. The purpose of feeds is: (1) to increase the daily energy intake without having recourse to any large meal; (2) to diminish the acidity of gastric contents at times when it is tending to become high (*a*) by dilution of gastric contents, and (*b*) by adding a buffer solution which will neutralise acid. Feeds should, therefore, not be of a bulky character and for practical purposes should not exceed about 8 oz.

Increase and Change of Meals.—Any increase or change in meals should be carried out in accordance with certain definite physiological principles. *It is probably correct to say that the main function of the stomach is to secure liquefaction of the food before it passes on to the duodenum.* The treatment of peptic ulcer is designed to cut down the movements and acid secretion in the affected parts to a minimum, and this will largely be secured if the food is administered in a form which is already liquid or which will be liquefied with little effort on the part of the stomach. If the fluid is of highly nutritious character the necessary quantity will be smaller and a further advantage is thereby secured.

Applying the above principles, it must be borne in mind that the total daily intake of protein necessary for health is much lower than that which we are accustomed to accept, and palatability rather than purely metabolic considerations will decide the patient's requirements in this matter. At the end of six weeks he may begin to take a little meat; if it is minced it will pass the pylorus with less effort, but provided that he realises the principles underlying the treatment he can probably be trusted to mince it by mastication as thoroughly as will be accomplished by a machine. A lamb cutlet, a little chicken, or a little veal are the items usually first selected. One of these may be given at three meals a week at first, and subsequently at one meal daily. Soufflés are a form of food very useful in this disease and may be prepared with fish, cheese, or chocolate, and employed to give variety to the meals. The ingenuity of the patient, of his wife, and of his doctor should be called upon to help at this stage.

Forbidden Foods.—A list of forbidden foods is not very helpful, but is perhaps necessary. It includes the following:—

(1) Fruits, raw or cooked, with the exception of—
(*a*) Bananas, which can be taken mashed with cream and sugar.
(*b*) Orange juice, which can be given well sweetened.
(*c*) Stewed apple. This must be carefully prepared so as to be thoroughly soft and freed of all pips, skin, and pieces of core. The American name for this is apple sauce, which admirably conveys the nature of the prepared dish.
(*d*) A very little ripe soft fruit may be given at a later period, but only in the smallest quantities, and never more than once or twice weekly, being allowed solely on account of its palatability.
(2) Green vegetables and salads, raw or cooked.

It is doubtful whether raw vegetables, especially salads, can ever be permitted, even in the smallest quantities. No form of food appears to excite so much effort on the part of the stomach. As regards cooked vegetables, it must be remembered that few of them have any high calorie value, and they are, therefore, a form of food which is very wasteful in a patient requiring an easily digested diet of small bulk and high energy value. Mashed potato has already been mentioned as of great value. As regards other vegetables, the criterion as to whether they may be permitted should be whether or not they will,

when served, pass through a sieve. Spinach, cooked in the continental manner and served with butter, is permissible occasionally, and other sieved vegetables may be employed to secure a periodic change.

Currants, raisins, &c., are clearly excluded from the diet by the above rule and, indeed, I know of no other means by which practitioner and patient alike can so readily decide whether a food is suitable or not. Bearing this in mind for the moment, it becomes obvious that such things as ice-cream, blancmange, custard, biscuits, sponge cake, and Madeira cake, can be granted in reasonable amounts, whilst such things as boiled puddings containing fruit, stodgy cakes, soups containing hard cereals or vegetables, stringy meat, and many other articles of diet are most undesirable.

(4) *Treatment by Drugs.*

Treatment by drugs is designed solely for the purpose of preventing any excess of hydrochloric acid in the stomach or duodenum. Belladonna and alkalis are the most useful preparations for this purpose.

(*a*) Belladonna, either in the form of tincture or of a solution of atropine sulphate, is the one drug which will actively inhibit the secretion of hydrochloric acid. To produce such an effect after absorption it must be given in doses which will tend to cause dryness of the mouth and dilatation of the pupil; if, however, it can be brought in contact with the gastric mucosa it will produce a local effect in very small doses, just as a lamella of atropine will produce dilatation of the pupil without any central effects. 5–7 minims of tincture of belladonna in half a tumbler of water can, therefore, be taken by the patient every morning on waking, and this easy form of medication should be continued for many months after the symptoms have ceased.

(*b*) Alkalis act by neutralising acid after it has been secreted. It is not yet certain what is the most useful combination of these preparations. The magnesia salts are probably the most active, but it has recently been shown that potassium citrate may be almost equally effective. Bismuth carbonate and prepared chalk are of far less value, but are sometimes useful as diluents when other salts are proving too relaxing in their action. The following prescription is useful:—

Magnesium carbonate heavy
" " light
Bismuth oxycarbonate
āā grs. 20.
A teaspoonful to be taken after feeds.

This, however, frequently proves to be strongly cathartic, in which case the proportion of bismuth must be greatly increased or potassium citrate and prepared chalk added to it.

A teaspoonful of some such preparation should be taken at a time when the acidity of the gastric contents is likely to be at its highest when two-hourly feeds are employed, the optimum moment is usually one hour after each meal or feed, and extra doses may with advantage be taken once or twice during the evening after the last meal.

Alkalosis is a definite danger, especially in patients with any chronic renal change, or with any tendency to pyloric stenosis. It is probably a wise precaution to stop the administration of alkalis for 48 hours once a month, and when there is any probability of alkalosis, the magnesia salts should be avoided altogether and preparations containing citrates or sodium phosphate substituted.

Tobacco and Alcohol.

(*a*) *Tobacco.*—It is widely believed that smoking is very deleterious for patients with peptic ulcer. Whether this is a nicotine effect, or whether it is in some other way connnected with cigarette-smoking it is impossible to say. It is, however, wise to persuade patients, whenever possible, to abstain completely from the use of tobacco.

(*b*) *Alcohol.*—The practitioner is invariably asked whether alcohol is permissible. There is no apparent reason why it should be completely prohibited. The best rule is to permit its use provided that the patient avoids: (*a*) all drinks containing really strong alcohol; and (*b*) all alcoholic drinks of a bulky nature. Thus, one glass of light red or white wine can be taken with meals during the later stages, and there is probably no harm in a patient taking a single glass of light beer or lager between meals in hot weather. When there is reason to suppose that such moderation will not be observed, it is clearly wiser to prohibit alcohol altogether.

Duration of Treatment.

At the present day it is impossible to say for how long treatment on these lines should be pursued. Several years is clearly the minimium period, and when the patient has been carefully trained by his practitioner, the observation of the régime outlined above for such a period offers no real hardship. The chief difficulty is encountered with patients whose business obliges them to travel extensively. When such persons are in town the multiplicity of tea-shops makes it easy for them to observe the rules, but when they have to travel between towns, or in the country, it is sometimes exceedingly difficult. Recourse must then be had to a pocket-flask containing milky feeds, or to biscuits and chocolate to be taken every two hours. It will further be found in such cases that the alkaline powder is very bulky and cannot be carried easily. The patient should be instructed to keep a bottle of the powder both at his home and at his office, and if these are not accessible, he should be provided with soft compressed tablets which will readily dissolve in the stomach and yet be portable. It is well here to emphasise the fact that to allow a patient to take grs. 5 or 10 of alkali after meals is a pious gesture the continuance of which may be avoided with benefit to everyone concerned.

Conclusion.

In conclusion, it is perhaps worth while drawing an analogy between peptic ulcer and diabetes. Both are dangerous diseases calling for prolonged and careful treatment. The dietetic indications in the two diseases bear no resemblance to one another beyond the fact that the régime of the patient suffering from gastric or duodenal ulcer is fully as difficult and important as that of the diabetic. It is beyond dispute that at the present day a relatively small proportion of our profession has grasped the importance of the dietetic treatment of peptic ulcer, and this fact bears some relation to the increasing number of such patients and the frequency with which dangerous abdominal operations are performed in the mistaken belief that effective medical treatment has been attempted and has failed.

T. IZOD BENNETT, M.D., F.R.C.P. Lond.,
Physician to Out-patients, Middlesex Hospital.

UNIVERSITY OF LEEDS.—The annual report on the department of pathology and bacteriology of the University by Prof. Matthew J. Stewart and Prof. J. W. McLeod includes this year an abstract report by Prof. R. D. Passey on the development of the department of experimental pathology and cancer research. The staff of this department apart from the professor now consists of Dr. J. S. Young, assistant director; Mr. H. J. Channon, biochemist; Dr. Georgiana M. Bonser, Mr. G. H. Collinson, Ph.D., Dr. I. Berenbloom, and Dr. G. H. Shaw, Cancer Research Fellows: and Dr. Desirée M. B. Gross, part-time assistant. Prof. Passey reports that Lumby Hall and an estate of 21 acres have been taken over for a period of five years as an experimental farm. Prof. Stewart and Prof. McLeod record a large all-round increase in the number of routine investigations carried out by the staff of the department during the past year, and refer to 18 papers published from the department of pathology and bacteriology during 1927. Preliminary steps have been taken in the matter of preparing plans for the new pathological institute which is to be erected. At the request of the Leeds Board of Guardians Prof. Stewart prepared a new scheme for pathological services at St. James's Hospital, including the provision of a well-equipped pathological laboratory, and the services of a part-time qualified pathologist, and whole-time laboratory assistant. Dr. H. V. Phelon, a former member of the staff of this department, was appointed to the new post, and commenced work in June, 1927. At the same time he was appointed an honorary demonstrator in pathology in the University, and has since given valuable help in connexion with the museum tutorial classes. The opening of the new laboratory is part of a larger scheme for bringing the poor-law hospital of Leeds into the front rank of such institutions.

Special Articles.

EIGHTEENTH ANNUAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS.

BOSTON, OCT. 8TH–12TH.

(FROM A SPECIAL CORRESPONDENT.)

THE eighteenth annual Clinical Congress of the American College of Surgeons was held in Boston from Oct. 8th–12th. This meeting was especially notable for the fact that Dr. FRANKLIN H. MARTIN (Chicago), its Director-General, and the man mainly responsible for its establishment, was for the coming year chosen its president. The services rendered by Dr. Martin to the cause of surgery, public health, and preventive medicine generally are known on both sides of the Atlantic, and the American profession are well aware of the benefits which he has conferred on them and the public by becoming the moving spirit of the American College of Surgeons. Already the College has brought reforms into the practice of surgery and raised the standard of hospitals throughout the United States and Canada.

MONDAY, OCT. 8TH.

The opening meeting of the Congress took place on Oct. 8th in Symphony Hall, Boston, in which 1500 delegates and guests listened to the opening addresses and saw the guests introduced.

An address of welcome was delivered by Dr. FREDERIC J. COTTON (Boston), chairman of the committee of arrangements, when Dr. GEORGE D. STEWART (New York), as retiring president, passed in brief review the work which had been done by the College during its existence, singling out for especial praise the raising of the standard of hospitals in the United States and Canada. He said that if all the other projects and undertakings of the College were to fail, the reforms introduced into the hospital system would always remain as an enduring monument to the vision and executive abilities of its chief founder.

The foreign guests were then introduced and among these were Dr. Daniel J. Cranwell (Buenos Aires), Sir Charles P. B. Clubbe (Sydney), Sir George A. Syme (Melbourne), Sir Charles Ballance, Mr. Thomas P. Dunhill, Sir Squire Sprigge, and Mr. G. E. Waugh (London), Dr. Percy T. Hughes (Bromsgrove), Dr. T. de Martel (Paris), Mr. Louis L. Cassidy and Mr. Charles J. MacAuley (Dublin), Prof. Vittorio Putti (Bologna), Dr. Rafael Reygades, and Dr. Ulises Valdes (Mexico City), Mr. Charles G. F. Morice (Wellington, New Zealand), Dr. Farquhar Macrae and Prof. Archibald Young (Glasgow), and Sir John Lynn-Thomas (Llechryd, Wales).

The inaugural address was then given by Dr. FRANKLIN MARTIN upon the Evolution of Medicine and Surgery in Relation to the Preservation of Health. The speaker dealt largely with the question of the degenerative diseases and predicted that the profession would soon be solving unknown problems that cause many unforeseen tragedies in middle life, and which foster the dread of death or of incapacity in old age. He pointed out that the degenerative diseases cause one-third of our deaths, while they are definitely influenced by ill-habits of life, over-strenuous mental activities, improper diet, and excessive use of stimulants, the factors that weaken resistance. Longevity, he said, would rise vastly with a general awareness of these things, while the degenerative diseases, the principal causes of senility, began at the age of 45, the most useful period of life, the sudden deaths in middle age being due to neglected conditions. Therefore he advocated periodical health examinations, which properly conducted by the family practitioner should reveal early beginnings of the degenerative diseases of middle life, when appropriate treatment should prevent or postpone their development. He pointed to the thorough physical examination of millions of soldiers in the Great War as proof of the value of scientific medicine, and as having convinced all thinking men of the wisdom of periodical scrutiny under the supervision of scientific medicine. Industrial and labour circles had now become impressed with the value of such examinations, and he traced the connexion between periodical examinations and the preservation of health which already was visible as a wholesome evolution in the practice of medicine. He concluded his interesting address by deploring the fact that the advances of science must leave many practitioners behind the times.

The last address on the evening's programme was the John B. Murphy Oration in Surgery delivered by Prof. VITTORIO PUTTI, with malignant bone tumours as a subject. Prof. Putti, speaking in fluent and eloquent English, after paying tribute to the memory of John B. Murphy as a pioneer in every branch of surgery and especially of bone surgery, pointed out that malignant bone tumours presented primarily a problem of diagnosis, the differentiation between benign and malignant bone tumour being difficult. There was nothing, he said, especially distinctive about the malignant type, while surgical intervention must be the sheet-anchor in treatment. He stated the opinion with decision that uncertainty in diagnosis, and consequent hesitation on the part of the patient, coupled with reluctance of the surgeon to undertake a mutilating operation, too often led to useless attempts at a conservative cure, when the loss of precious time took from the operation most of its chances of success. Dr. Putti expressed the hope that X rays had not yet exhausted their resources; the efficiency of operative treatment would increase step by step as early first manifestations of tumours were recognised and operations were undertaken without delay.

TUESDAY, OCT. 9TH.

On Tuesday evening, Oct. 9th, in the immense and crowded ballroom of the Copley-Plaza Hotel, a long programme was gone through.

The Hunterian Oration[1] was delivered by Sir SQUIRE SPRIGGE, Editor of THE LANCET, who pointed out that Hunter had been written about almost voluminously ever since his death, but who drew attention to the Hamilton letters, published in the early part of this year in THE LANCET, as throwing sidelights on the intimate life of both John and William Hunter from the work-a-day and social standpoints. A clear impression was conveyed of the practical genius who introduced such novel conceptions into physiology and pathology as to earn rightly the title of the "father of modern surgery." Speaking to the title of "Grand Curiosity" Sir Squire said that Hunter's many-sided investigations and observations, which had led to so great results, were all impelled by a consuming curiosity; with the spirit of a questioning child, Hunter demanded from Nature the why and wherefore of everything.

In a symposium on ureteral transplantations which followed, papers were read by Dr. ROBERT C. COFFEY (Portland, Oregon), Dr. CHARLES M. MCKENNA (Chicago), and Dr. ARTHUR H. CURTIS (Chicago), who dealt with the subject from various aspects of causation and treatment, while Dr. CHARLES H. MAYO (Rochester, Minnesota) spoke learnedly on the contributory causes of genito-urinary anomalies. Dr. GEORGE G. SMITH and Dr. WILLIAM C. QUINBY (Boston) took part in the discussion.

WEDNESDAY, OCT. 10TH.

Wednesday evening, Oct. 10th, was given over to a special meeting of the Boston Surgical Society for the presentation of the Henry Jacob Bigelow medal to Dr. CHEVALIER JACKSON, of Philadelphia, a pioneer

[1] The Oration appeared in full in THE LANCET of Oct. 13th, p. 739.

in bronchoscopy. With the aid of pictures on the screen, Dr. Jackson told the story from the beginning. The first work in bronchoscopy, he said, was done, under deflected sunlight, at the Massachusetts General Hospital in 1898, but the procedure did not become useful for the removal of foreign objects, or for the treatment of pathological conditions, until the use of artificial light in investigating the bronchi and trachea. Anything, he suggested, which can be introduced into the mouth can be swallowed or inspired, so that coins, nails and tacks, safety pins, teeth—natural and false—pieces of food, bullets, toys, little crucifixes, and parts of motor-cars had been removed from one or other passage at his clinics in Philadelphia. He emphasised the point that 90 per cent. of these foreign bodies were in those passages because of the carelessness of the public, and he showed numerous slides depicting both the peccant objects and the gross want of care on the part especially of mothers. He stated that since the establishment of alcohol prohibition there had been fewer cases of the swallowing of false teeth and of choking through swallowing large pieces of food, while evidence was coming in that bronchoscopy provided an effective aid to diagnosing certain forms of malignant disease, and was a useful mode of treatment of many ailments.

At the conclusion of Dr. Jackson's address he was presented with the medal by Dr. Harvey Cushing.

THURSDAY, OCT. 11TH.

On the afternoon of Oct. 11th, a symposium on cancer was held, when Dr. ROBERT B. GREENOUGH (Boston), chairman of the committee on the treatment of malignant disease with radium and X ray, read the report of the committee; Dr. JAMES F. PERCY (Los Angeles) read a statistical report of cautery surgery in uterine cases; Dr. GEORGE GRAY WARD (New York) dealt with radium therapy in carcinoma of the cervix uteri; Dr. WALTER E. SISTRUNK (Rochester, Minnesota) read a paper on the criteria of malignancy in cancer of the breast, and Dr. GEORGE W. HOLMES (Boston) discussed the results of X ray treatment of cases of cancer of the breast.

On the same evening Prof. ARCHIBALD YOUNG (Glasgow) read a report with comments thereon of two cases of chordoma, a malignant sacrococcygeal tumour and a tumour of the dorsal spine. The paper was illustrated with charts and photographs.

The next paper was read by Sir CHARLES BALLANCE, with the title Some Thoughts on the Nature of Cancer. He passed in review the experiences of a long professional career as bearing upon the investigations and observations of himself and others with regard to malignant disease from various aspects, and while speaking in hopeful terms as to the outcome of the researches of medical science in dealing with the greatest of disease problems, he deprecated the launching of campaigns to educate the public concerning its manifestations. In his opinion fright brought about by such means might be a contributory cause of cancer, as of other diseases. But he looked forward to the day when the now necessary operations and other curative and remedial measures applied to cancer could be supplemented by preventive measures, antitoxic treatment in the form of vaccine. A pleasing feature of Sir Charles Ballance's address was his complimentary reference to the earnest and honest work done by Dr. William Coley, of New York, in the field of cancer research and treatment.

Dr. GEORGE W. CRILE (Cleveland) then spoke on the adrenal factor in hyperthyroidism, in which he propounded a novel theory with regard to the relationship of the adrenal to the thyroid gland. Dr. FRANK H. LABEY (Boston) discussed the paper. Sir JOHN LYNN-THOMAS closed the evening's discussions by showing some interesting motion pictures dealing with orthopædic surgery.

On the evening of Oct. 12th, the convocation of the College of Surgeons was held in Symphony Hall, and proved a picturesque and imposing ceremony. Seven hundred surgeons from all parts of the United States, from the Far East, South America, and Canada, were admitted to fellowship, when honorary fellowships were granted to Sir Charles Alfred Ballance, Sir John Lynn-Thomas, Sir Squire Sprigge, and Sir George A. Syme, First President and Founder of the College of Surgeons of Australia.

The Presidential Address was then given by Dr. FRANKLIN MARTIN, who in stirring words sketched the history of the College. Dr. WILLIAM J. MAYO (Rochester, Minnesota) followed with an address on the right education of the surgeon, after which there was an informal reception of the new Fellows.

CLINICS AND AFTERNOON SYMPOSIA.

Various meetings were held during the busy week on the practical aspects of medicine. Hospital standardisation, in particular, was fully discussed, when it was found to be a general belief that in a properly standardised hospital all patients must have an accurate record made and kept of how the illness developed, of the diagnosis, treatment, and condition on discharge; while too much stress, it was thought, could not be laid on the attempt to make patients realise that the case-record is of so great importance to their proper care and welfare that they should coöperate with the authorities in every way possible for the purpose of securing the necessary information. The Board of Regents of the College of Surgeons approved the proposal of Dr. Frederic J. Cotton, chief surgeon of Boston City Hospital, that hospitals holding a place on the approved list of the College be required to "follow up" patients six months after treatment, keeping record of their recovery or failure to improve.

Clinics were held throughout the meeting at the various hospitals in Boston, and were largely attended. At one of these meetings it was stated that there are persons who have so much workmen's compensation, sickness insurance, and fraternal organisation benefits that their income is larger when they are sick than when they are at work, an obvious abuse for remedy, made possible only by the very fact that the medical profession gives its hospital services freely. During the meeting clinical demonstrations were held on the surgery of the eye, ear, nose, and throat. An important open forum and symposium on traumatic surgery was held in which the subject of industrial medicine and surgery was discussed from all angles. The principal clinics took place at the Massachusetts General, Boston City, Robert Brigham, Huntington Memorial, New England Deaconess and Children's Hospitals, and the Free Hospital for Women.

During the meeting Rear-Admiral Cary I. Grayson was elected President of the Gorgas Memorial Institute of Tropical and Preventive Medicine. Another interesting event was the presentation to the Massachusetts General Hospital of Boston by the Associated Anæsthetists of the United States and Canada of a bronze bust of Dr. William T. G. Morton, discoverer of ether. The presentation was made by Dr. F. H. McMechan, secretary to the Organised Anæsthetists of North America, in the dome room of the Massachusetts General Hospital which is kept as a shrine to the discoverer of ether.

At the annual meeting of the Fellows of the College, held at the Copley-Plaza Hotel on the afternoon of Oct. 11th, Surgeon-General Merritte W. Ireland (Washington) was elected President of the American College of Surgeons for 1929, and Dr. William W. Pearson (Des Moines, Iowa) and Dr. Perry G. Goldsmith (Toronto) were elected Vice-Presidents.

About 2500 Fellows of the American College of Surgeons attended the meeting, which from all points of view was a conspicuous success. The weather was delightful, the organisation was excellent, the clinical material was diverse and well selected, and the hospitality unbounded. To Dr. Franklin Martin, Director General of the College, and to Dr. McEarchen and Dr. Crowell, Associate Directors, all congratulations are due.

MINISTRY OF HEALTH.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER, 1927.

Sir George Newman reviews the state of the public health in England under 14 headings. His introductory chapter deals with population, births and deaths, notifiable infectious diseases, sickness and invalidity. Sections follow on General Epidemiology, Tuberculosis, Venereal Disease, Cancer, Maternity and Child Welfare, the Insurance Medical Service, Relation of Food to Health and Disease, Medical Intelligence and Environmental Hygiene, Acute Rheumatism, Light Therapy, International Health and Health Education. He then summarises the record of 1927 with appropriate comments and supplies as appendices statistical tables and a list of the personnel of his department.

The principal facts concerning the physical life and health of the people in England and Wales during the year under review were the birth-rate of 16·6, the lowest on record; the death-rate of 12·3 per 1000, of which deaths 36·4 per cent. occurred under 50 years of age, and an infant mortality-rate of 70 per 1000 births, being the same as in 1926. The chief causes of death in order of mortality were diseases of the heart and circulation (201 per 1000 deaths), bronchitis, pneumonia and other respiratory diseases (157); cancer (111); diseases of the nervous system (90) and all forms of tuberculosis (79). These five conditions are together responsible for 64 per cent. of the death-rate, and it is against them even more than against the epidemics feared by our grandparents that battle has to be waged. It is impossible to compress all Sir George Newman's views and hopes for the improvement of the public health into small space, but it seems desirable to ascertain what he has to say as to the prevention and treatment of these devastating diseases.

PREVENTION OF DISEASES OF HEART AND CIRCULATION.

Acute rheumatism and syphilis are the diseases whose sequelæ are responsible for many of the deaths directly due to lesions of the circulatory system. It is pertinent to inquire what steps are being taken under the auspices of the Ministry to combat rheumatic infections and venereal diseases.

Acute Rheumatism.

Sir George Newman holds that a general compulsory notification of acute rheumatism would probably be impracticable at the present time in view of the difficulties of exact definitions, but that a valid case can be made out for the experimental trial of a system of compulsory notification for a definite period of years in selected districts where housing and other records are readily available, where an efficient machinery exists for investigating the cases notified, and where institutional accommodation can be obtained. These conditions are fulfilled in Paddington and Kensington, where acute rheumatism in children under 16 years of age is now notifiable.

The Paddington scheme of compulsory notification came into force on March 1st, 1927, but the Rheumatism Supervisory Centre at the Paddington Green Children's Hospital, under Dr. Reginald Miller, had been opened on Oct. 9th of the previous year, and Dr. Miller and Dr. M. Sanderson have published a report showing the working of the centre during the first year.

The number of cases dealt with was 175, of which six were judged to be definitely non-rheumatic; and of the remainder (169) only seven seem to have been notified under the compulsory notification system in force in Paddington, the rest being referred through the hospital, school medical service, or coming from adjoining areas. Of the 169 cases 13, or only 8 per cent., showed active rheumatic infection; 51, or 30 per cent., showed potential and mild rheumatism; whilst 105, or 68 per cent. showed quiescent rheumatic infection at their first attendance.

This classification will show the extreme difficulty of attempting differentiation. The observation, supervision, and treatment of children in the earliest stages of rheumatic infection with a view to studying the first appearance of serious disease, and the prevention of heart disease are regarded as the most important functions of this centre.

The Kensington scheme commenced on Oct. 1st, 1927, the rheumatic centre being situated at the new Princess Louise Hospital, under the direction of Dr. R. C. Lightwood.

Investigation is being made into environmental factors such as locality, housing (with special reference to dampness), family incidence, social position and the conditions of school life, and into certain clinical factors, especially the effect of tonsillectomy and institutional treatment, and into the significance of certain physical signs in connexion with acute rheumatism.

In the West of England a scheme for the prevention, treatment, and research into ætiological factors of rheumatism is in process of evolution. The area covered by its activities will be the counties of Gloucester, Somerset, and Wiltshire, and the cities of Bristol and Bath.

Work is to be directed towards accumulating more accurate information as to the distribution of heart disease of rheumatic origin, studying ætiological factors of the disease, providing expert examination and diagnosis for cases of heart disease in children, and obtaining information as to the need for institutional or other specialised types of treatment.

The central coördinating agency is a cardiac clinic at the General Hospital at Bristol, in charge of Dr. Carey Coombs.

The accommodation in England for children suffering from this disease is strictly limited. The Metropolitan Asylums Board provides 230 beds, the Invalid Children's Aid Association 46 beds (and 85 for convalescent heart cases), the Birmingham Local Education Authority 90 beds.[1] Thus something is being done to stem the tide of this vast burden of disease, but, as Sir George Newman says, it is not enough. The need is urgent and the continuance of this widespread and disabling condition is impairing the strength of the nation. There is a pressing need for coördinated action for the thorough and continuous investigation of this malady in all its forms, and then for a well-devised and systematic attack upon it.

In this connexion Sir George Newman calls attention to the reports published by the Ministry on (1) Incidence of Rheumatic Disease, and (2) Acute Rheumatism in Children, respectively reviewed in THE LANCET of March 1st, 1924 (p. 451), and July 30th, 1927 (p. 245).

Venereal Disease.

At the close of 1927 the number of V.D. treatment centres was 186—viz., 177 in England and 9 in Wales. The number of sessions averaged 780 weekly, of which 549 were in voluntary hospitals, 158 in special premises, and 73 elsewhere. The number of centres at which attendance can be made at any time of the day or evening was five. It is hoped that three more centres will be reorganised during the present year to provide these all-day facilities. Besides the treatment provided at the regular centres special arrangements exist at 11 maternity and child welfare centres by which women and children discovered to be suffering from gonorrhœa or syphilis can be treated there. The number of hostels for the care of girls suffering from venereal diseases was 14 and the number of cases maintained in them in 1927 was 895 as compared with 903 in 1926. There are eight institutions for the reception of pregnant women suffering from venereal diseases, and there is similar provision in ten of the hostels mentioned above. Included among these hostels there is one special institution for the care of children suffering from gonorrhœal vulvo-vaginitis, or from congenital syphilis, and the number of cases treated there in 1927 was 51. The number of medical officers, either whole or part-time, employed at the 186 centres was 389. The number of laboratories approved for pathological tests in connexion with diagnosis was 76, and the total number of tests

[1] This accommodation is being extended by the provision of 350 additional beds at Carshalton (see THE LANCET, Oct. 20th, p. 829), and by some 20 beds at Cardiff (see p. 896). ED. L.

carried out for treatment centres and practitioners was 308,408. The returns from venereal disease treatment centres for 1927 show a 3·7 per cent. increase in the new cases of syphilis, a 9·1 per cent. increase in those of gonorrhœa. The number of those who attended for advice on the suspicion that they were suffering from venereal disease again increased, indicating the continued popularity of the centres, while the attendances, an inverse index of defaulting before completion of treatment, were, in 1927, 46·4 per cent. more than in 1920, though the total new cases were 17,049 (16·2 per cent.) less than in 1920 and the total new cases diagnosed as venereal disease were 22,831 (26·7 per cent.) less.

The Avoidance of Relapse.—An analysis of results of treatment of male cases of syphilis at the St. Thomas's Hospital Treatment Centre shows clearly that even in primary cases in which serum reactions have not yet become positive less than two courses of ten injections each of "914" (or equivalent in other arsenobenzene compounds) and of bismuth or mercury totalling approximately 6 g. "914" and 3 g. bismuth results in too high a percentage of relapses, while three such courses are barely sufficient for early cases in which the blood reactions have become positive. The analysis shows clearly, also, the great advantage of commencing treatment whilst the serum reactions are still negative.

The Question of Compulsory Treatment.

Notification was originally introduced in connexion with acute infectious diseases and was primarily designed to give information which would allow the health authorities to take action to protect the public. These diseases were of relatively short duration and the period of infectiousness could be predicted with fair accuracy. When one considers statutory notification in connexion with the more chronic communicable diseases, such as tuberculosis and venereal disease, it is clear that quite different considerations arise.

The conveyance of infection in venereal disease usually implies special circumstances, sexual intercourse, &c., and these diseases are not comparable in this respect with the ordinary notifiable infectious diseases. Then again there is a social relationship and stigma in the case of venereal disease which causes reluctance on the part of medical practitioners to certify venereal disease. The existence of a system of notification is also only too likely to lead patients to conceal their condition as long as possible and have recourse to "quacks" (who will promise secrecy) instead of obtaining sound medical advice promptly or attending clinics or hospitals. Moreover, notification may inflict some injustice, and perhaps even irreparable social harm, upon innocent individuals or families. Again, syphilis and gonorrhœa are diseases which may be greatly prolonged in the individual, and pass through various stages or degrees of history, severity, and infectivity, and hence it might be impracticable to define the stage of disease which should be notifiable. On the whole, therefore, it has hitherto been deemed inexpedient to introduce a compulsory system of notification of venereal disease.

It is not infrequently suggested that the local authority should have powers of compulsory treatment of venereal disease, particularly in the case of persons who have begun treatment without finishing it. If official notification be an incentive to concealment and a deterrent to effective treatment, *a fortiori* is this true of compulsory treatment.

Defaulters.—It is alleged that "defaulters" should at least be compelled to continue their treatment for venereal disease. In England it is estimated that about one-third of the persons who submit themselves for treatment fail to continue it to the final stage of cure. The question is not as simple as it appears. After all, what is a defaulter? In any given community the persons suffering from venereal disease fall into three groups: (1) those who submit to complete treatment, (2) those who submit to partial treatment, (3) those who are not treated at all. It seems clear that all the persons who submit to partial treatment, and still more those who are not treated at all, are in fact the defaulters, that is to say, they do not submit themselves to complete treatment. But it must be remembered that the complete treatment of syphilis by salvarsan is a prolonged and serious undertaking; the patient may well be kept under supervision for two or even three years. At what stage in this long process of treatment can it fairly be said that a patient defaults in the sense that he has become a danger to the community?

There is a further question which will occur to us, How far does such defaulting take place in the treatment of other diseases? How many patients suffering from other maladies always complete the treatment prescribed for them? How many persons with unsound teeth default in dental treatment? How many unfinished medicines repose in domestic cupboards? How many defaulters are there for operation for adenoids, or for rheumatism, for tuberculosis, or for cancer? It is necessary to view this question of default circumspectly and consider its bearings in regard to social conditions as well as medical and surgical treatment generally. The cause of default in prolonged treatment must first be established—the disease may have been remedied, or the patient may be dead, or have left the district, or prohibitive circumstances may have arisen to prevent the continuation of treatment. Again, compulsory treatment by the State implies guarantees of cure, which cannot be given; and such compulsory treatment must entail no risks of life or injury.

These are the general grounds which have hitherto imposed serious limitations on any proposal for the compulsory treatment of disease. In the particular disease of syphilis there is a further issue, for the only justification for any form of compulsion would be an assurance that compulsory treatment of the individual ensured the protection of the public from the risk of infection by him. On this we must remember, first, that long before the syphilitic defaulter can be declared completely cured he has, in nearly all cases, become non-infective; secondly, that syphilis infection is not usually conveyed through ordinary social life, but only by direct and particular sexual intercourse; and, lastly, any compulsory treatment, to be effective upon the community, must be applied to all cases of venereal disease and not to those only who have commenced but failed to complete treatment. It seems at present impracticable to fulfil these conditions.

(To be continued.)

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Censorship of Publications.

THE second reading of the Censorship of Publications Bill was under discussion in the Dail last week, on the motion of Mr. FitzGerald-Kenney, Minister for Justice. The principal provisions of the Bill were given in these columns some weeks ago.[1] From the Minister's statement it appears that the Bill is not intended to cover so wide a ground as its actual wording suggests. The words in the Bill in reference to a book or edition that "it is indecent or obscene or tends to inculcate principles contrary to public morality or is otherwise of such character that the sale or distribution thereof is or tends to be injurious or detrimental to or subversive of public morality," are taken by the ordinary reader to signify grounds of complaint on other grounds than of indecency or immorality merely in regard to sexual matters. The Minister stated that the Bill would only deal with indecency or immorality in respect of sexual matters, and promised to add such words to the Bill as would make this limitation clear. Had the Bill been clearly drafted in the first instance in this essential clause, much of the opposition roused by the wider interpretation would have been avoided. The clause was universally read as bringing expressions of opinion on philosophical, sociological, and even religious matters within the purview of the Bill The definition of the term "indecent" as including "calculated to excite sexual passion or to suggest or incite to sexual immorality or in any other way to corrupt or deprave" has given rise to much criticism. The last words render the definition so wide that the Censorship Board could bring under it anything that they disliked or of which they disapproved. Moreover, it is pointed out that sexual passion is not immoral, unless wrongly directed, and that to declare indecent anything which may excite sexual passion is unjustified. (One critic, indeed, had suggested that the

[1] THE LANCET, August 18th, p. 354.

Minister for Justice must be tainted by the Albigense heresy.) The Minister recognises that the definition is unduly inclusive, and he has expressed his willingness to amend it. On the question of contraception he and the Government are adamant. No book or periodical which has a word to say in favour of contraception will be permitted to circulate in the Irish Free State. A clause of the Bill which brings advertisements of cures for venereal disease and of methods of procuring abortion under the terms of the Indecent Advertisements Act, 1889, does not apply to advertisements in newspapers. It only applies to advertisements affixed to walls or otherwise exposed in public places.

Mr. FitzGerald-Kenney's statement does little more than clear away certain misunderstandings due to culpably careless drafting. On the general principle of a censorship; on the procedure of the censorship board, a tribunal sitting in secret without those whose property is affected having any right of defence, and without any provision for appeal; on the suppression of discussion on a live sociological question of the day; on all these he, and presumably the Government, stand fast. The discussion in the Dail, however, showed a greater degree of independence than was expected. From all parts of the house there were warnings of the danger of making a censorship too powerful, or of giving it too wide a scope. Many speakers, admitting that there was little exception to be taken to a censorship of periodicals, held that no case had been made for a censorship of books. Some of the most outspoken speeches came from the Government benches. There were, no doubt, some whole-hearted support for the Bill, and some demands that it should be made even more rigorous than it is. One deputy declared that there were books like Gustave Flaubert's (*sic*) 'Sappho' and Fielding's 'Tom Jones' that should not be permitted in this Christian country." It is clear, however, that the Bill is likely to be pruned of some of its more dangerous clauses before it becomes law.

Amalgamation of Hospitals.

Prof. W. Boxwell, in an inaugural address at the Meath Hospital last week, took up the defence of the small hospital. He said that 120 occupied beds gave ample material for teaching students. The ideal number of students was half a dozen, and it was impossible for one man to teach the elements of anything practical to a large class at one time. In the small hospitals the student came into direct touch with disease and the general management of the sick from the moment that he started clinical work. The patient in a small hospital which was well equipped had a large share of the doctor's individual attention, as well as that of the student. In a great hospital, instead of a class of 20 students, they would have a class of 100. In such a hospital there would be eight or ten qualified men, who would stand up between the student and the practice work that he was anxious and quite fit to do. He admitted that with amalgamation they would gain centralisation. There would be a greater opportunity and wider field for the men at the head of the profession, and accurate records would be kept.

Royal College of Physicians in Ireland.

The annual meeting of the College was held on St. Luke's Day in the College Hall. Dr. W. A. Winter, was re-elected President, Dr. H. T. Bewley treasurer, and Dr. T. P. C. Kirkpatrick registrar. The following censors were appointed:—In medicine: Drs. J. A. Matson and R. H. Micks. In midwifery: Dr. S. Sheill. In medical jurisprudence: Dr. J. T. Wigham. In the evening the St. Luke's Day dinner was held, some 80 Fellows and guests being present. Among those who spoke were Sir John Moore, the Chief Justice of the Irish Free State, and the Bishop of Tuam.

School of Physic, Trinity College.

The Rockefeller Foundation has recently made arrangements with the authorities of Trinity College for the endowment of a limited number of Fellowships in the School of Physic. Each Fellow, who will be paid at the rate of £500 a year, will devote his time to teaching and research. In the present year Dr. R. A. Q. O'Meara has been appointed Fellow in Public Health; next year a Fellow in Biochemistry will be appointed; a third in another subject in the following year. The whole scheme will be reconsidered at the end of five years.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Advertising as Unfair Competition.

NOT long ago four medical men were prosecuted at Hamburg before the criminal court for having advertised their services to the public. Hitherto advertisement in the daily papers has been punished only by the professional courts of honour, but in this instance the public prosecutor brought an action for unfair competition because the defendants had advertised themselves as specialists in venereal diseases, which they were not. At the trial they had to admit that they had not had any training other than that enjoyed by the average practitioner, and they were fined M.50 each and costs. The court held that the unfair competition consisted not only in their describing themselves as specialists, but also in their advertising at all. As respectable medical men do not advertise an advertising practitioner competes unfairly with colleagues who obey the rules of the profession. This judgment will be of fundamental importance if it is upheld by the higher courts.

Control of Venereal Disease.

The new law concerning the prevention of venereal disease has now been in full operation for one year, but little is heard, either in the medical or lay press, of legal proceedings being taken under any of its provisions. The measures taken in Berlin have lately been described by Prof. Schweers, a member of the Municipal Health Office, who states that the city has started 17 dispensaries, with 46 specialists, where people suffering, or believing themselves to suffer, from venereal disease may receive free consultation without their names being asked. The dispensaries, he said, have been much frequented during their first year, some 12,000 men and 9000 women having applied for treatment or advice. 9000 cases of venereal infection have thus been ascertained, the patient being either treated at the dispensary or referred to his sick-club or his medical attendant. Nurses appointed in connexion with the dispensaries have to visit the patients at home and see that the disease is not further spread and that the origin of the infection has been discovered. The city authorities have also opened departments for venereal diseases in their hospitals, and here the patients are attended free of charge, no attempt being made to recover the costs, as is sometimes done after treatment of other conditions. By day and night the dispensaries distribute preventives free of charge, and though this practice was at first much criticised from a moral standpoint it is now agreed that venereal disease must be fought with every available weapon. Prof. Schweers says that there have been only 350 cases in which patients have been compelled by the police to attend the dispensaries. The law places the medical man under obligation to notify cases in which patients do not complete their cure. In the first year 2000 such cases have been notified, and it is hoped that the number will greatly diminish when the public become aware that they need fear no violation of professional secrecy by the staff and that they may have confidence in the measures taken. The state of things now is very different from what it was formerly, when prostitutes were registered and medically examined. In the city of Berlin with 4,000,000 inhabitants only 7000 prostitutes were registered, and

it was obvious that there was a much larger number of unregistered women who regularly or in times of unemployment were prostitutes but were never examined. To watch those 7000 women there was a staff of 130 police, and this department has now been entirely abolished, the matter being in the hands of the health authorities. The complaint is made that since the abolition of the department prostitutes are seen more commonly; but this has nothing to do with the law against venereal diseases, for the police still have the right to clear the streets of these undesirable women.

Proposed Reform of Medical Study.

The overcrowding of the curriculum with so many special subjects has led to a demand for reform and several plans have been suggested. Prof. Brauer, of the great Hamburg Hospital, thinks that the results at medical examinations are unsatisfactory because it is no longer possible for students to be trained in every branch of medicine. He considers that after the preliminary examination in normal anatomy, physiology, and chemistry the medical course should be limited to internal medicine, surgery, gynæcology, and obstetrics, and that only these subjects should be taken in the final examination. The proposal is that other medical and surgical studies should no longer form part of the ordinary curriculum, and it follows that anyone who wants to practise them should be obliged to take an extra course of post-graduate study to qualify himself as a specialist. If an examination was required at the end of such courses it is felt that the number of inadequately trained specialists would be reduced.

Restriction of Remedies Used in Insurance Practice.

A list of remedies suitable for club practice has been issued by a committee composed of representatives of the German Society for Internal Medicine, the Pharmacological Society, the medical press, the Society of Licensed Chemists, and the Ärzte Vereinsbund. This committee was set up some time ago with the object of eliminating the enormous quantity of ineffective, unnecessary, and too expensive compounds on the market. It examines the compounds to see whether they are suitable for club practice, and to ensure impartiality the examination is done at pharmacological university institutes, at university clinics, and at hospitals. If the reports are satisfactory the name of the preparation is included in the list. To pass the test it must be sufficiently proved that the remedy is effective and innocuous, its composition must be known, and the advertisement of the producer must be in accordance with the facts.

Shortage of Hospital Assistants.

Notwithstanding the overcrowding of the medical profession and the obstacles to younger medical men engaging in practice there is always a demand for assistants in hospitals. In nearly every issue of the medical journals there are advertisements in which hospital authorities offer vacant places, and such advertisements sometimes appear in several successive issues. The reason is not always the inadequate payment, these appointments being intended for younger medical men who do not want money so much as experience. Prof. Brunner, of Munich, offers the explanation that the medical assistant is nowadays overburdened with work. During the period of prosperity in Germany municipal authorities used to erect lavishly furnished hospitals. Since the war, however, they have been compelled to save by making the hospital staffs as small as possible. The departments have sometimes been made so large that the chief physicians are unable to examine their patients regularly, and the principal work thus devolves on the assistants. Moreover, there is an enormous mass of clerical work to be done in the public hospitals; after a hard day's work the assistant has to write histories of his cases, which, with few exceptions, for ever disappear in the archives of the hospital. This work should be done by shorthand writers. The routine task of examining urines and other secretions, which takes so much of the time of the assistant, might well be left to nurses.

There are other drawbacks, also, to taking an assistantship. Nowadays a medical man is admitted to club practice, at any rate in the greater cities, only after having settled there for four years. The assistant who enjoys a good training can settle only after his assistantship is finished, and he thus loses several years in comparison with the average medical man, who settles immediately after having qualified.

Statistics of Sick-clubs.

According to a recent statistical report 20,288,000 people are insured against illness in sick-clubs under the workmen's insurance laws. The dependants of insured persons also enjoy some of the benefits, and if they are included it may be said that some two-thirds of the German population belong in some way or another to a sick-club. There are 7679 institutions of this kind under various descriptions in Germany, the biggest being the Berlin General Sick-club with over 484,000 members; there are, moreover, a number of clubs for special trades. In 1926 only 45·3 cases of illness for each 100 members were registered, compared with 52·3 cases in 1925; but the average duration of an illness had lengthened to 26·1 days in 1926 as against 24·6 in the previous year.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Indoor Ultra-violet.

THE regular advertisement and one may suppose the regular sale of ultra-violet transmitting glass for the making of windows for school-rooms and office-buildings has suggested to Dr. Janet H. Clark, of the Johns Hopkins School of Hygiene, some experiments measuring the amount of ultra-violet that actually reaches the interior of a room through such a medium. The quantity is too small for direct measurement, but Dr. Clark overcomes this difficulty by measuring first the ultra-violet intensity from the skyshine at the window-sill (direct sunlight is ruled out, since obviously neither school-children nor stenographers could work in its glare), and then comparing the intensity of illumination at the window-sill with that in the centre of the room. Detailed calculations will be found in a recent issue of *Science* (August 17th). The conclusion is that only 1/120th of the north sky ultra-violet reaches the middle of the room. A child would have to sit in this position for 20 hours to receive as much ultra-violet as he would receive in two minutes out of doors in the noon sunlight. Dr. Clark feels that it is cheaper and more efficient to give the school-children a short noonday recess than to invest in any special window glass.

The Trend of Venereal Disease.

The New York State Department of Health recently sent a questionary to the physicians in "upstate" New York asking whether venereal diseases were increasing or decreasing. Less than half of those who replied would venture an opinion, but 1826 physicians stated a definite opinion as follows: decrease, 961 (52·5 per cent.); no change, 445 (24·4 per cent.); increase, 420 (23·1 per cent.). Education and prophylaxis were the main reasons given by those who believed in a decrease, as causes of the decrease; while those who had experienced increased incidence attributed this to moral laxity and better diagnosis, showing that some of them, at least, consider the increase as apparent rather than real. Forty physicians in each group named prohibition as a source of increased and of decreased incidence respectively. Extraneous evidence received by the officers of the health department leads them to believe that the majority opinion favouring a decrease in incidence is correct.

CENTENARY OF KING'S COLLEGE.

WORK OF THE MEDICAL FACULTY.

IN connexion with its centenary next year, King's College, London, is making an appeal for funds which will be warmly commended by the medical profession. One of its first Faculties was that of medicine; not long after its establishment, in 1839, the College initiated King's College Hospital in Lincoln's Inn Fields; and from the very beginning medical science has flourished within its walls. Among those responsible for the Faculty in the early days were such men as Herbert Mayo, Richard Partridge, and John Curnow, the anatomists, and Bentley Todd, William Bowman, Lionel Beale, and William Rutherford, the physiologists. Others on its staff have been David Ferrier, Peter Thompson, T. J. Brodie, Alfred Garrod, and Gerald Yeo, whilst it will always be remembered with pride that the College was responsible for bringing Lister back to London in the face of considerable opposition. We need only recall the names of Prof. Arthur Robinson, Prof. David Waterston, Prof. J. E. S. Frazer, Prof. E. Barclay-Smith, Prof. W. E. Dixon, Prof. W. D. Halliburton, and Sir Charles Martin as representative of the many distinguished men who have worked at the College in later years to the advantage of medicine.

Before the war the number of students in the Medical Faculty was about 170, but last year it had risen to 211. The College has the advantage of coöperating not only with King's College Hospital at Denmark-hill, but also with St. George's, Charing Cross, and Westminster Hospitals from which students come for pre-clinical work. Those who receive their medical education at the College have the considerable advantage of coming into contact with students who are studying other subjects, and their outlook is to some extent broadened as it would be at Oxford or Cambridge. Unfortunately, however, although the laboratories have been largely remodelled and extended, the anatomical department is still housed in premises which are none too satisfactory, and one of the objects of the centenary appeal for £350,000 is the improvement of accommodation there. A 200 years' lease has been acquired of an area of nearly 5000 square feet above Aldwych Station, and the building to be put up on this site will enable the College to meet the modern requirements of all its departments except those of chemistry and anatomy, which can best be secured, it is stated, by rebuilding the south-east block and erecting new buildings for anatomy upon the roof at a cost of about £60,000. The anatomical department would there find itself immediately beside the department of physiology, and teaching could be carried out in closer association with the clinical schools. At present the chairs in both these subjects are unendowed, and it is urgently desired that a sum of £25,000 should be found to endow, at any rate, the chair of physiology.

Subscriptions to the Appeal Fund may be sent to the treasurers (who are Mr. Reginald McKenna and Sir Edward Troup) at the College, cheques being made payable to the King's College Centenary Appeal Fund. The Duke of Connaught is President of the centenary commemoration Committee, and the medical members are Sir John Atkins, Prof. E. Barclay-Smith, Dr. Michael Beverley, Sir Charlton Briscoe, Prof. Albert Carless, Sir Lenthal Cheatle, Sir Watson Cheyne, F.R.S., Sir John Cockburn, Prof. W. D. Halliburton, F.R.S., Prof. R. Tanner Hewlett, Dr. Graham Little, M.P., Mr. H. Willoughby Lyle, Prof. Greville Macdonald, Prof. R. J. S. McDowall (Dean of the Medical Faculty), Dr. Charles S. Myers, F.R.S., Sir W. J. R. Simpson, Lieut.-General Sir Arthur Sloggett, Sir StClair Thomson, and Sir Nestor Tirard.

EAST SUFFOLK AND IPSWICH HOSPITAL.—On Saturday last Princess Mary opened a new pathological department which has been built and equipped at a cost of £12,500.

BRITISH MEDICAL ASSOCIATION.

COUNCIL DINNER.

THE seventh annual Council dinner of the British Medical Association took place on Oct. 17th at the Hotel Victoria, London, a large and distinguished company being present. The chair was occupied by Dr. H. B. BRACKENBURY, the Chairman of Council.

Those present included Sir Robert Philip (retiring President), Lord Eustace Percy (President of the Board of Education), Lord Cozens-Hardy, Sir Boyd Merriman, K.C. (Solicitor-General), Sir John Rose Bradford (P.R.C.P.), Sir Thomas Barlow, the Lord Mayor of Cardiff (Alderman A. J. Howell), Sir Ewen Maclean (President, B.M.A.), Mr. N. Bishop Harman (treasurer, B.M.A.), Sir Robert Bolam, Sir Philip Magnus, Surgeon Vice-Admiral Gaskell, Dr. R. A. Fleming (P.R.C.P. Edin.), Dr. Walter Carr (President, Medical Society of London), Dr. Graham Little, M.P., Dr. Andrew Balfour, and Lieut.-Colonel F. E. Fremantle.

After the toast of "The King" had been loyally pledged, Dr. Brackenbury proposed "The Retiring President" in terms of warm appreciation. All who had been brought into relationship with Sir Robert had, he said, been struck by the magnetism of his personality and the charm of his oratory. His official tenure began with esteem, it was ending with a sentiment of real affection, which the speaker was sure would be as enduring as it was sincere. It was hoped that there would still be many occasions on which his help to the Association would be forthcoming. He also referred to the new arrangements which had been made concerning the Association's large library, which would not need the continuance of the post of honorary librarian. In this connexion he had great praise for Mr. W. G. Spencer, and he alluded to the fact that in 75 of the 96 years of the Association's life a member of the Honeyman family had officiated in the library. The toast was accorded musical honours.

Sir Robert Philip, in responding, said he had been much touched by the warmth of the references to himself, and in return he thanked the whole Association for the great kindness every member with whom he had come into relationship had shown him. He was most anxious to express his indebtedness to the Representative Body for numberless acts of real friendliness. He concluded by giving a brief sketch of the history of the Association, from its inception 96 years ago in Edinburgh, owing to the energies of Dr. Hastings, till now with its membership of 34,000 and its annual revenue of £80,000. It was contended by many, he said, that the Association was a trade-union. He would concede so much as to admit that it was a union of highly trained medical men whose lives were dedicated to the service of their fellow creatures in the direction of the relief of suffering and the prevention of disease, and in the development of these aspirations no outside interference would be allowed. While the Association maintained its main concepts it was bound to go on from strength to strength.

Mr. Bishop Harman submitted the toast "The Common Health," remarking that such a toast was so comprehensive that it included every other. His theme was the progress of the healing art and the consequent betterment and greater expectation of life of the community. A very large factor in this was the medical inspection of schools, which at first received the frowns of masters, mistresses, and teachers, whereas now the school medical officer was not only welcomed but was expected to accomplish the impossible. He tilted at the present-day popular instructors of the public in health matters and the bewildering variety of their advice. He would say it was good for a man to eat and to do what he liked, so long as he found he could go on liking it.

Lord Eustace Percy replied. He admitted there were a number of serious problems in regard to health, but as he felt in holiday mood he did not intend to inflict a discussion of them on the assembly. He felt much more inclined to utter his feeling of sincere pleasure at the extraordinary progress which had been made in medical matters in recent years; the improvement in "the common health" in the last 20 years had been most striking and gratifying. He had been particularly struck with the marked improvement in school health, which coincided with the establishment and development of open-air schools, and with the introduction of physical training. It was not easy to see how far hygiene could be taught by direct instruction, but more help was likely to come from physical training than from anything else. He concluded by paying a graceful tribute to the devotion and continuous activity of the general practitioner. Though confessedly there were not many signs of fatigue at this festive board, he had never been able to understand

how the average doctor survived the perpetual calls upon his time and energies.

Sir Ewen Maclean, in proposing "Our Guests," expressed the sense of appreciation of the Association that so many distinguished men had accepted the invitation to dine.

Sir Boyd Merriman, in the course of an amusing reply, said he had never understood how a chemist, who received a prescription in some unknown hand and in hieroglyphics which were unintelligible to the ordinary person, could at once make it up. Was it that the front of the prescription was intended to impress the ordinary layman like himself, and that on the back, in practically invisible ink, was written some mutually understood sign, such as "No. 9"? In the name of himself and his fellow guests, he took off his hat to the British Medical Association and all that it stood for.

Sir Thomas Barlow also responded, making a special point of his appreciation of the increased contributions to the Royal Medical Benevolent Fund.

Dr. J. W. Bone proposed the toast of "The Chairman," alluding to his various activities, medical and municipal, and Dr. Brackenbury briefly replied.

Between the speeches some excellent musical items were rendered.

Obituary.

ALEXANDER NAPIER, M.D., F.R.F.P.S. GLASG.

BY the death of Alexander Napier in his native city one of the few remaining links with the Lister clinic in Glasgow has been severed. Born in Glasgow in 1851 he began the study of medicine in 1867, and had already passed the qualifying examinations a year before he was entitled to practise. After spending a year in post-graduate work in Berlin he became conversant with German ideas and literature in medicine, and translated for the New Sydenham Society Eulenberg and Guttmann's "Physiology and Pathology of the Sympathetic System," and Guttmann's "Handbook of Physical Diagnosis."

At Glasgow he chose the south side of the city and soon established himself in a large family practice. But his interests and energies were not such as could be confined to the area of professional activity. A keen volunteer, he became associated with the old 3rd Lanarkshire R.V., and retained this association in the new Territorial Force, becoming commanding officer with the rank of colonel of one of the Scottish general hospitals at Stobhill during the war.

From 1880 till 1888 he was assistant to the professor of materia medica in the University, and for long intervals during this period was solely responsible for the conduct of the class. From 1888 till 1893 he was professor of materia medica in Anderson's College of Medicine. When the Victoria Infirmary was established in 1890 he was appointed one of the visiting physicians, and retained this post for 29 years. There was no aspect of medical or scientific activity in the city to which he did not contribute his share. He was librarian to the Faculty of Physicians and a member of the Council; he took an active interest in the Medico-Chirurgical Society and in the Southern Medical Society, of which he was President; he was a member of the Royal Philosophical Society; and much of his time and energy was devoted to the development of St. Andrew's Ambulance Association. A physician of the old school, he was classed by the younger generation with Gairdner, Finlayson, McCall Anderson, Middleton, and Gemmell. He was, however, keenly alive to all the significance of the more recent exploits in medical investigation, and assessed with keen insight and firm judgment the value of new discoveries. He was one of the first, if not the very first, to introduce Koch's tuberculin. Generous and unselfish to an intense degree, he eschewed the more popular prizes of professional success for a life of devoted service, and his name will be remembered by his patients, by his professional brethren, and by all those with whom he came into contact in the wider fields of his work, with appreciation and gratitude.

I. M.

Correspondence.

"Audi alteram partem."

"HYPERVITAMINOSIS" AND "VITAMIN BALANCE."

To the Editor of THE LANCET.

SIR,—The experimental observation that vitamins exert their normal physiological action when consumed in very minute doses naturally leads to the inquiry "Have the vitamins any injurious effect when consumed in abnormally large amounts?" A similar question arises, "Does an increased or diminished consumption of one vitamin affect the body's requirements for the others?"

To Takahashi [1] must be given credit for the first suggestion that vitamins in large excess might be toxic. In 1922–25 he published papers in which the isolation of pure vitamin A ("biosterin") was claimed, and in describing the product he mentioned that massive doses (16 mg.) proved fatal to rats. Prof. J. C. Drummond and his collaborators, however, had been engaged in a patient research in the same field and were able to contradict Takahashi's claim to have isolated the vitamin. Using carefully prepared concentrates no toxic action could be noticed in large doses, and it was suggested that the Japanese worker had been deceived by the presence in his preparation of poisonous by-products. Subsequent interest in the problem naturally became small, and it was generally assumed that to both the questions in the preceding paragraph a negative answer could be given.

There have appeared from time to time, however, several isolated and little known observations, mostly recorded in somewhat inaccessible literature, which seem to deserve more attention than they have received. In 1923 the pioneer investigator, Sir Frederick Gowland Hopkins [2] had made mention of researches in which excess of cod-liver oil had often been found injurious to rats unless "balanced" by an increased marmite (vitamin B) allowance. On somewhat similar lines Euler and Widdell (1925) made the surprising claim that excess of cod-liver oil caused disturbances in the growth and bone formation of rats unless balanced by *vitamin C*. More recently Agduhr (1926) [3] has reported that feeding excessive amounts of cod-liver oil to various animals produces degenerative changes in the heart, although Höjer (1926) [4] has attributed these results merely to an inadequate provision of the B-vitamin complex. Gladys Hartwell (1927) and Barnet Sure (1927) have also carried out isolated work on the excessive feeding of cod-liver oil, special attention having been drawn to the injurious action of large excess of the oil during gestation.

In all the foregoing work cod-liver oil or its concentrates were used as sources of vitamin excess. Recently a new field has been opened by the use of irradiated ergosterol, the richest known source of vitamin D, in place of cod-liver oil. Pfannenstiel (1927),[5] and Kreitmair and Moll more fully in 1928,[6] claim to have produced ill-effects by the administration of this material in massive doses; the latter workers were able to observe extensive depositions of calcium in the body and a generalised sclerosis—phenomena which are of interest in view of the known action of vitamin D in increasing Ca (or P) absorption. That these records should be received not without some scepticism, or

[1] Jour. Chem. Soc., Japan, xliii., 826.
[2] Brit. Med. Jour., 1923, ii., 693.
[3] Acta Pædiatrica, v., 319.
[4] Ibid., vi., 2.
[5] Klin. Woch., xlviii., 2310.
[6] Münch. med. Woch., lxxv., 637.

at least confusion, is understandable; for numerous other workers have recorded the harmlessness to a human of "large" doses of irradiated ergosterol, or to a rat up to 10,000 times the minimal effective dose.

During the past year an attempt has been made in our laboratory to collate experimentally some of these scattered observations. A thorough survey is in progress, but we think it advisable to summarise the results so far obtained, which, in a general way, confirm definitely the idea of a harmful effect resulting from excessive intake of certain vitamin concentrates. Our main conclusions are briefly as follows:—

1. *Excessive Irradiated Ergosterol.*—Young rats given synthetic diets containing 0·1 per cent. of irradiated ergosterol (i.e., 100,000 times the concentration adequate for protection from rickets) invariably lost weight rapidly and died. Great loss of appetite occurred, so that at death there was an appearance of inanition, recalling the effect observed in cases of vitamin B deficiency. Only in one instance, however, did an increase of the vitamin B allowance to four times the usual level cause an appreciable delay in the development of these ill-effects. Non-irradiated ergosterol (devoid of vitamin D) given to controls in the same amount caused no loss of appetite or deviation from the normal growth-rate, nor did smaller doses (0·001 per cent. and 0·00001 per cent.) of either irradiated or non-irradiated ergosterol. The ill-effects may quite conceivably have been caused by impurities in the irradiated ergosterol rather than by vitamin D itself, but, since we have found that heated ergosterol has no deleterious effect, it is obvious that impurities which are common to the processes of heating and irradiation cannot be held responsible. Similar tests are in progress on specimens of activated ergosterol in which the D factor has been destroyed by over-exposure to irradiation. Among other aspects of the problem being examined are: the intestinal reaction, Ca and P absorption, and electrocardiographic changes.

2. *Increased Vitamin D Allowance accompanied by Total Vitamin B Deprivation.*—We found no appreciable change in the onset of B-avitaminosis in animals provided with 100 times the normal allowance of vitamin D as irradiated ergosterol.

3. *Excessive Cod-liver Oil and Retarded Growth.*—Rats given restricted allowances of vitamin B (marmite) were found to have distinctly lower growth-rates when cod-liver oil was substituted for the 15 per cent. of Arachis oil (inactive) supplied in our synthetic diet.

4. *Skin Lesions resulting from Excess of Cod-liver Oil Concentrates (A and D) in the Absence of Vitamin B.*—Rats receiving massive doses of cod-liver oil concentrate (kindly supplied by Messrs. Lever Bros.) in conjunction with a diet deficient in the vitamin B complex often developed loss of hair and sore areas of the skin (superficially bearing resemblance to B_2 deficiency, "pellagra"). Such symptoms were not observed in rats suffering from plain vitamin B deficiency, nor in rats receiving an adequate supply of marmite in addition to the concentrate.

5. *Failure of Pregnancy on Excessive Cod-liver Oil.*—In confirmation of Hartwell and of Sure, we observed that normal gestation always failed in rats receiving a diet containing 15 per cent. of cod-liver oil.

It would seem probable that while some effects of "vitamin excess" are due to the vitamin itself, others may more likely be due to other bodies present in the concentrate. Any evidence so far available for "vitamin balance" is not so clear-cut as might be wished.

We think it desirable to add, in case of possible alarmist fears, that the quantity of vitamin D which proves toxic to a rat, although forming less than 0·1 per cent. of the diet, is yet some 100,000 times an adequate "physiological dose." The toxic dose varies somewhat from one species to another, but there should be little practical danger to humans of ill-effects from excessive vitamin intake.* The application of these studies lies more in that little understood problem—the mode of vitamin action.

We are, Sir, yours faithfully,

LESLIE J. HARRIS, Sc.D., Ph.D.
THOMAS MOORE, D.Sc.
Nutritional Laboratory (Medical Research Council), Cambridge, Oct. 18th, 1928.

VACCINATION REFORM.

To the Editor of THE LANCET.

SIR,—In reply to the letter of Sir Leonard Rogers I may say that as long ago as 1885, when the severe type of small-pox was very prevalent in London, I was for some months brought into contact with cases almost daily, and learned fully to value the protective power of vaccination. Times and circumstances, however, change; it is well for us all from time to time to review the foundations of our beliefs and practice, hence in my address I deliberately raised the question of the necessity of universal vaccination, under present conditions, for those not likely to be specially exposed to the risk of infection by severe small-pox. Three outstanding facts influence me.

1. The practice of vaccination in this country has for a long time been steadily declining, until now I suppose a very large minority, perhaps an actual majority, of the population is unprotected even by one vaccination. No doubt from the public health standpoint the ideal would be universal vaccination in infancy and revaccination at intervals of from seven to ten years afterwards. The worries of medical officers of health would be greatly lightened thereby. Does anyone, however, seriously imagine that, under present circumstances, there is the least probability of any material increase in the number of vaccinations? Do not all the indications point to a continuance of the steady decrease which has been going on for so long? Especially whilst we have with us a form of small-pox which carries few if any terrors except its name, and which gives rise to little if any more malaise and discomfort than does vaccination itself. Possibly the modified form of vaccination recommended by the Committtee on vaccination may arrest the decrease, but even if this change is adopted, some years must elapse before we should know much about the amount and duration of the protection which would be afforded.

2. Despite the diminution in the number of vaccinations performed, epidemics of severe small-pox in this country are now comparatively rare and are controlled with ever-increasing effectiveness by isolation and vaccination of contacts. A mortality of 44 per cent. in one recent outbreak sounds very impressive, but Sir Leonard Rogers does not mention the total number of cases. So also do the 278 unvaccinated child victims in the Gloucester epidemic of 1895; but things have changed much in the succeeding 33 years; what was the mortality in the more recent epidemic in that city? For many years past we have been repeatedly assured on the highest authority that a widespread and fatal epidemic of small-pox was certainly impending in our increasingly unprotected community, but the prophecy is not fulfilled, and it is dangerous to cry "wolf" too often. Not so many years ago warnings, as lurid as those we have heard so often of the risks of small-pox, might have been given of the dangers threatening us from plague or from cholera, both frequently epidemic in the gravest forms in other parts of the Empire,

* Since our letter was written this question has been discussed in an annotation in the current LANCET. The results of Hess and Lewis (Jour. Amer. Med. Assoc., 1928, Sept. 15th, p. 783), who administered irradiated ergosterol to rickety infants at the admittedly high level of 2·5–5 mg. per diem, are there quoted. These authors obtained remarkable benefit in every one of a large number of cases with only two instances of clinical disturbance due to hyperglycæmia. We agree with them that any indiscriminate use of unreasonably large doses of irradiated ergosterol would be undesirable and that a fully adequate dose, according to all the evidence at present available, would be 0·5 mg. as a prophylactic, or 1·0 mg. for the average case of rickets.

but these diseases have ceased to be a serious menace, although plague in past centuries and cholera much more recently caused an enormous mortality here. Is it not reasonable to believe that small-pox may be in process of becoming gradually as innocuous in this country as plague and cholera have already become?

3. Lastly we have had during recent years the disquieting occurrence of cases of post-vaccinal encephalitis. It is probably impossible to know how many there have been in England and Wales; they do not figure under deaths from "Vaccinia" in the reports of the Registrar-General, but the disease is admitted to have caused at least 48 deaths during two periods of about 33 months in all. It is said, quite truly, that this is an infinitesimal figure among the total number of vaccinations performed in that period, although it is almost as large as the number of deaths attributed to small-pox during the same time. An immediate, even if small, danger, however, makes a greater impression upon the mind than a remote and possibly even eventually bigger one. Certainly it is a tragedy for a child, previously perfectly healthy, to die from post-vaccinal encephalitis, and it is at least fair to ask and to discuss the question whether the need for the prevention of small-pox at the present time justifies this sacrifice of healthy young lives. It is important and significant to note that in Holland the incidence of this disease has led to the temporary suspension of compulsory vaccination.

I shall doubtless be told that, so far as we know at present (admittedly we do not know much), the great majority of these cases occur in children who have not been vaccinated in infancy and that consequently the occurrence of the disease is an additional argument for the performance of vaccination during the early months of life. I anticipate that, so long as small-pox continues to be as mild as it has been in recent years, to tell the parents of an infant that he ought to be vaccinated at once, because if the operation is postponed a few years the risk of illness and possible death from disease of the brain will be greater, is not an argument which will make much appeal to the average English parent.

I am, Sir, yours faithfully,

J. WALTER CARR.

Cambridge-terrace, N.W., Oct. 21st, 1928.

DEATHS UNDER ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The cases of death under anæsthesia reported by Dr. Ross Mackenzie and Prof. Shennan in THE LANCET of Oct. 6th are of great interest, but fortunately the first and third at any rate are much more severe risks than are likely to be met with often in ordinary practice. The second case, however, appears of a commoner type, and in this connexion I wish to draw attention to what may be a common error in the treatment of cases of collapse under spinal anæsthesia—that is, the practice of raising the head or putting the patient level. This is, of course, done under the assumption that the symptoms are due to the anæsthetic agent reaching the medullary centres, but there is, I believe, little if any risk of this after ten minutes, at any rate if the light solutions are used.

The fall in blood pressure occurring with spinal anæsthesia is nearly always swift and often severe—e.g., from 140 systolic to 54 in ten minutes—but is usually accompanied by a slow regular pulse; it is the falling pressure with rapid pulse, as in the case reported, that causes most anxiety. If not the only source of danger this fall in blood pressure is probably the most serious, and is best combated by the adoption of the Trendelenburg position, which has often been shown to result in an increase of the systolic pressure by as much as 20 or 30 mm. Hg, which is no small amount in a collapsed patient. The free use of oxygen is of considerable benefit, combined with carbon dioxide if the respirations are very weak. The customary stimulants, such as strychnine, camphor, and pituitary, appear to be without demonstrable effect on the pulse or blood pressure when once the latter has fallen.

I am, Sir, yours faithfully,

R. J. CLAUSEN, M.B., B.S.

Wimpole-street, W., Oct. 17th, 1928.

A CENSUS OF BLIND-AND-DEAF CHILDREN.

To the Editor of THE LANCET.

SIR,—The National Institute for the Deaf is now considering the question of the early training of children who were born, or have become both blind and deaf. It is obvious that unless such unfortunate children are specially and suitably cared for from very early life, their lapse into physical and mental incompetence is almost unavoidable. At the present time no distinctive provisions are available for the care of such young children. Single-type institutions, either for the blind or deaf, cannot receive them. We are anxious to get to know of the numbers of these doubly afflicted children who do not generally come under the notice of public authorities until an age at which the retardation, due to silence and sightlessness, has become of grave importance and difficulty. It has been suggested that an appeal to doctors, nurses, and those concerned with hospitals, baby welfare clinics, and other organisations dealing with childhood would be likely to help us in tracing these blind- and deaf-children. May we therefore request those of your readers who may know of cases of children of any age up to eight years, who are both blind and deaf, to help us by sending us full particulars of them?

I am, Sir, yours faithfully,

A. J. STORY, Secretary.

2, Bloomsbury-street, New Oxford-street, W.C.1
Oct. 22nd, 1928.

FEE-SPLITTING.

To the Editor of THE LANCET.

SIR,—In your recent editorial on this subject you quote a signed statement that this practice is universal in the State of Ohio. I practised as a College physician for four years in Ohio, and had frequent recourse to consultations. On only one occasion did a consultant offer to share his fee with me. It is admitted that my clients were not wealthy, and that the consultants might be a selected group, but at least I feel qualified to sign a statement that in Ohio the practice of fee-splitting is *not* universal.

I am, Sir, yours faithfully,

Oct. 10th, 1928. ROSSLYN EARP.

HÆMATOLOGICAL ABSTRACTS.

To the Editor of THE LANCET.

SIR,—I have been asked to undertake the preparation of abstracts of British works on hæmatology for the new French periodical *Le Sang*. The work would be much facilitated if authors would be so kind as to send me reprints of their papers. Articles dealing with diseases of the blood, symptomatic blood changes, blood cells, leucocytic enzymes, and blood chemistry are included.

I am, Sir, yours faithfully,

A. PINEY, M.D.

Cancer Hospital, Fulham-road, London, S.W. 3,
Oct. 16th, 1928.

WELFARE WORK AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—"A. B." does well to call attention to a growing practice which in many cases amounts to an abuse. I would like to add to his experience an account of what happens in my district in the case of children of school age.

Every effort is made to force parents to take children to the school clinics. So sure as the child is away a

day the education officer is round pestering the parents to take the child to the school clinic. This worthy's attentions are not subdued notwithstanding that he is informed that the child is under a private practitioner's care and that a medical certificate is furnished. He calls again and again until the parents take their child to the clinic, even telling them that they must take their children there. The parent gets to believe this, or gives in to sheer persistent importunity, and the practitioner loses his case. The attendance officer is ably seconded by many of the school teachers who exercise similar persuasions on the parents and in many cases instruct the children to go to the clinics.

All this really amounts to touting for the children by the agents of the clinics. The private practitioner's hands are firmly tied, for he is not allowed to send agents to collect cases, but the clinic's agents seem to have carte blanche to scour the district for every sick child. This result is a very serious outlook for the practitioner. He is in a false position and must helplessly witness his own downfall.

I am, Sir, yours faithfully,

Oct. 20th, 1928. ALGY.

To the Editor of THE LANCET.

SIR,—A. B.'s letter in your last issue prompts me to ask whether these same welfare workers may not be instructed to use discrimination in their visits to mothers who have recently given birth. When my first child was born, my house was visited, although I should have thought that the patent fact that it is a doctor's house might have been sufficient deterrent. I happened to be in at the time, and firmly, but kindly, pointed out how unnecessary her visit was—she agreed. Soon after the birth of my second child, again did a welfare worker appear on the scene. This time it was my wife who was interviewed, who also pointed out that a doctor's house was hardly one which she should have considered it her duty to visit. She, however, persisted with her string of questions, until it must have dawned on her how unwelcome she was when she departed.

Surely these people should pursue their work amongst the needy and those not sufficiently educated in the laws of health and cleanliness, and who cannot afford to call in their doctor except in cases of real urgency.

I am, Sir, yours faithfully,

Oct. 23rd, 1928. C. D.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Lt.-Comdr. O. North is placed on the Retd. List.

Surg. Lt.-Comdr. O. J. M. Kerrigan to be Surg. Comdr.

J. W. L. Crosfill to be Surg. Lt.

The following appointments are notified: Surg. Comdr. J. C. Sinclair to *Cleopatra*; Surg. Lts. A. R. Ewart to *Lupin* (on recommg.); J. D. Sayers to *Herald* (on recommg.); and D. C. Drake to *President*.

ROYAL ARMY MEDICAL CORPS.

Maj. J. T. Simson retires on retd. pay.

The undermentioned from the seconded list are restored to the establishment: Majs. R. G. Martyn and T. H. Twigg; Capt. A. P. Draper and Lt. (on prob.) F. Walsh.

Maj. E. L. Fyffe retires, receiving a gratuity.

Capt. W. J. F. Craig is secd. whilst undergoing a course of study in Japan.

D. G. Hamilton to be Temp. Lt.

ROYAL AIR FORCE.

The undermentioned are granted short service commissions as Flying Officers for three years on the active list: J. L. Groom, N. M. Jerram, G. W. Paton, and G. O. Williams.

Flying Officer P. B. L. Potter ceases to be seconded to the Princess Alice Memorial Hospital, Eastbourne.

INDIAN MEDICAL SERVICE.

Lt.-Col. J. H. Murray retires.

Temp. Lts. to be Temp. Capts.: Bhalchandra Kondopant Phatak and Gurbaksh Dhamrait Rai.

The undermentioned appts. are made: Gurdit Singh Malik, Bhairo Prasad Nigam, Sambhunath Roy, and Neelakanda Pillai Palpoo Pillai to be Temp. Lts.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of two large seaport cities:—

Name of city and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Hull .. .. (296,600)	21·0	13·2	1·22	1·43	3·0	2·1	82/32	7·9	4·3
Cardiff .. .. (225,600)	18·1	12·6	1·54	1·19	2·8	1·6	80/38	8·3	3·9

The death-rates of pre-school (1–5 years) children per 1000 births were: Hull 39, Cardiff 42.

Hull.

Dr. W. Allen Daley's report contains an account of an epidemic of poliomyelitis which we summarised on p. 705 of Oct. 6th. Of other infectious diseases diphtheria, as in 1926, was exceptionally prevalent; there were 747 notifications and 33 deaths. "The virulence of the disease," says Dr. Daley, "is increasing," and in one instance the three children affected in one family died. There is evidence that antitoxin is being given earlier and in more adequate doses. In September the offer of free immunisation was made. Of the three typhoid cases admitted to the city hospital, one was found to be a urinary carrier and discharged from hospital after a stay of five months, on condition that he should carry out a list of very stringent instructions.

The municipal houses erected since the war number 3342, 304 of which are on the North Hull estate outside the city. The types of houses are: 2231 parlour, 571 three-bedroomed non-parlour, and 490 two-bedroomed non-parlour. The demand for parlour houses is not maintained, and on the East Hull estate there were 35 parlour houses to let at the end of the year (rental 15*s*. 5*d*.). There is, however, a waiting-list of 1000 for the smaller type of municipal house let at 12*s*. 2*d*. to 13*s*. 6*d*. The most urgent need of the city is for houses to be let at an all-in rental of 6*s*. to 10*s*. per week to labourers and poorer artisans, who cannot afford to pay about 2*s*. per week for transport from the outskirts to their work. The corporation are now building exclusively non-parlour houses, and bricks are being used in preference to concrete or other method. The municipal programme comprises 4412 houses, and it is expected that another 970 will be added in 1928 to the 3342 already erected. The privy conversion scheme is expected to be completed in 1928. The work has been carried out with extraordinary rapidity. Up to the end of 1923 only about 2000 had been dealt with, and during the next four years over 30,000 of the estimated 40,000 conversions required were completed. There are still many courts, the houses of which are supplied with water from a common tap, and these are being dealt with. The new Smoke Act is being taken seriously, and since it came into operation the proprietors of 42 different works and premises have altered their plant in order to minimise the emission of smoke. At a number of other works the matter is under consideration. At the end of the year 1630 of the new municipal houses were fitted with "Cookanheat" apparatus, and 570 future houses will also be so fitted.

The average per head milk consumption of Hull is 0·41 pint. In comparison Manchester consumes 0·44, Bristol 0·41, Bradford 0·40, Cardiff 0·39, Newcastle 0·33, and Leeds 0·29 pints. Of 49 samples of outside milk examined for tubercle 5, or more than 10 per cent., were found to be infected. At the farms visited only one tuberculous udder was found, and in all the other cases cows had been disposed of after the taking of the sample, some of which were "suspicious." In one case the farmer was fined for failing to notify that he was in possession of a cow suffering from tuberculous emaciation. Among the 896 city cows no case of udder tubercle was found, but three suffered from tuberculous emaciation and were slaughtered under the Order.

Efforts are being made to reduce the mosquito nuisance and, up to the present, none of the anopheline type has been observed.

Dr. Daley says: "The most pressing public health problem remains almost unsolved—namely, the rehousing of the slum-dweller," but he indicates that the needs of the artisan, who can pay a moderate rent, have been almost met and that the task of tackling unhealthy areas can now be attempted. On one area a block of tenements was begun in 1927 and two new areas, comprising three acres and involving a population of 1116, were "represented."

Cardiff.

Dr. Ralph Picken records an advance all along the line. He deprecates the attempt to put a price on health and a money value on human lives. Treatment of sickness in Cardiff has been estimated to cost £200,000 and loss of wages from illness £150,000 annually. Unemployment alters the situation, and a life is only a monetary asset if it produces more wealth than it consumes. During the last six or seven years of declining trade and unemployment there is no clear evidence that the communal health has suffered, but it would be unwise to draw hasty conclusions, says Dr. Picken, as the less catastrophic forms of indigence are long in showing their effect.

A rheumatism supervisory centre is likely to be started soon as the result of bequests of money and of a building named Dulwich House, delightfully situated on Pen Hill at Llandaff. The number of school-children known to be suffering from severe heart disease and chorea is 212. An arrangement has been made with the Cardiff Royal Infirmary for keeping the records of the history, treatment, and progress of cases of cancer of the breast and uterus since Jan. 1st, 1926, and of the rectum since Jan. 1st, 1928. These records will become valuable as years go on. The percentage of deaths from pulmonary tuberculosis to all deaths between the ages of 16 and 25 was 21·6, an exceptionally high proportion in comparison with other towns, and one which shows over a long series of years a definite upward tendency. No real progress has been made in the provision of more adequate accommodation for advanced cases.

For two years there have been no deaths from scarlet fever. The case mortality from diphtheria was 4·3 per cent., and about 700 school-children underwent the full course of immunisation. There were three introductions of small-pox and six cases in all. The erection of the new small-pox hospital was hurried on in consequence and completed during the year. The accommodation for patients consists of a block with 10 cubicles, and a second block with accommodation for 21 patients in four wards, on a site just outside the city boundary. An increase in the new cases attending the venereal diseases clinics is noted, mainly due to the success of the special auxiliary clinic for women and children in association with the maternity and child welfare department. The excellent new laboratory, built in agreement with University College, was opened in June and serves the needs both of city and county; it houses the public analyst as well as the bacteriological department. A table shows what a large proportion of the infants and pre-school children attending the centres suffer from diseases or defects worthy of note. Thus, during 1927 832 out of 1941 infants and 215 out of 266 pre-school children so suffered. Another table shows the gradual increase of extra-domiciliary confinement from 13 cases per 1000 births in 1912 to 132 in 1927.

The amount of tubercle-free "graded" milk coming into the city daily is 193 gallons of Grade A (T.T.). Carefully collected information indicates that the great activity in house-building since the war has done little to relieve the congestion in working-class houses. A special house survey was made in October and November, 1927, including 3167 houses in which births occurred, 420 houses visited on account of tuberculous patients, and 297 houses visited in connexion with a rheumatic inquiry. A similar survey had been made in 1925. The comparison between the two surveys shows that the congestion in working-class homes is much greater in 1927 than it was in 1925, in spite of the fact that, taking the city as a whole, the average number of persons per house has been considerably lessened in recent years by house-building. The City Treasurer's report shows that the effective demand for houses of the type hitherto erected by the corporation has practically been met. It is difficult to avoid the conclusion, says Dr. Picken, that the demand would revive if houses of such a size and character were provided as could be let at a much lower rent than those which obtain at the present time.

The Port Sanitary Authority had a happily uneventful year. The school report records the opening of an open-air day school for 90 children; a more complete survey of crippled children; the continued success of ionisation treatment for ears; and an investigation which shows that the school meals provided are deficient in fat and vitamins and excessive in carbohydrate.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 13TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 162 (last week, 130); scarlet fever, 2984 (last week, 2581); diphtheria, 1322; enteric fever, 73; pneumonia, 1153; puerperal fever, 44; puerperal pyrexia, 119; cerebro-spinal fever, 11; acute poliomyelitis 21; acute polio-encephalitis, 5; encephalitis lethargica, 20; dysentery, 9; ophthalmia neonatorum, 104. No case of cholera, plague, or typhus fever was notified during the week. The increase in scarlet fever is very general over the country.

The cases of small-pox were notified from the following 14 counties: Chester, 12; Derby, 28; Durham, 35; Essex, 6 (West Ham); Lancaster, 5 (Leigh); Leicester, 7 (county borough); Northampton, 5 (county borough); Nottingham, 9; Stafford, 10; Warwick, 3 (Coventry); Yorks, East Riding 1 (Hull), West Riding 22; Glamorgan, 17; Monmouth, 2. No cases were notified from the County of London or from Northumberland.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 16th–17th was as follows: Small-pox under treatment 9, under observation 1; scarlet fever, 2408; diphtheria, 1680; enteric fever, 46; measles, 72; whooping-cough, 261; puerperal fever, 22 (plus 16 babies); encephalitis lethargica, 70; poliomyelitis, 2; "other diseases," 15. At St. Margaret's Hospital there were 12 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 14 (0) from measles, 12 (3) from scarlet fever, 23 (7) from whooping-cough, 21 (3) from diphtheria, 102 (35) from diarrhœa and enteritis under two years, and 61 (13) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Birkenhead and Manchester. Four fatal cases of measles were reported from Birmingham, 3 fatal cases of whooping-cough from Leeds. The number of deaths from diarrhœa and enteritis has diminished further, but Liverpool has still 17 to report and Stoke-on-Trent 5.

The number of stillbirths registered during the week in the great towns was 282 (corresponding to a rate of 44 per 1000 births), including 52 in London.

Medical News.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on Oct. 20th:—

M.D.—*J. A. Kerr, *R. A. Lennie, *Olive M. Somerville, and J. W. Hamilton.

M.B., Ch.B.—*T. L. Chapman, *G. L. Montgomery, *J. S. McMillan, *Jack Yonace, *R. G. Miller, Thomas Anderson, T. H. Anderson, James Barr, Norman Bernstein, Donald Cameron, Ian Campbell, D. K. McI. Chalmers, Hugh Chapman, W. J. Christie, Mary C. Clark, J. E. H. Cogan, Edward Collier, Robert Cordiner, W. L. Cuthbert, Neil Douglas, G. S. Easton, Thomas Elliott, John Ferguson, W. J. L. Francis, J. B. Gaylor, David Glen, R. E. Glen, Christina A. Greenshields, Elizabeth Grierson, Benjamin Guyer, D. McK. Hart, T. A. Haslett, D. M. Haugh, J. B. Henderson, J. A. Hill, John Jamieson, Elizabeth P. Macadam, Duncan Macartney, W. G. T. Macfie, A. M. Macgregor, Alexander MacInnes, Colin MacKenzie, William Mackie, George MacKinnon, H. R. MacLennan, Alexander Macnab, W. H. W. McWhirter, Alexander Miller, J. G. Miller, Mary E. Minihan, J. V. Ogilvie, W. L. Reid, E. A. Robertson, W. M. D. Robertson, J. A. Roughead, David Russell, T. S. Scott, James Simpson, Margaret O. Templeton, A. G. Thomson, James Tidd, John Trotter, Archibald Weir, Bessie L. M. Weir, C. H. Wilkie, and W. J. Woodward.

B.Sc. (with Second-class Honours in Pathology).—A. McN. Wyllie.

J. S. M. Robertson has been awarded the Brunton Memorial Prize, given to the most distinguished graduate in medicine of the year 1928.

G. L. Montgomery has been awarded the West of Scotland R.A.M.C. Memorial Prize.

* With commendation.

UNIVERSITY OF DUBLIN.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH.

Part I. Therapeutics, Medical Jurisprudence, Pathology, &c.—*E. S. Duthie, J. M. Gibbon, Arnold Rose, N. A. Kinnear, P. L. O'Neill, Reginald Bowesman, Charles Bowesman, Aaron Rakoff, and J. B. Scott.

* Passed on high marks.

In Completion.—D. G. McCaully, E. F. S. Morrison, and Charles Ryan.

MASTER IN OBSTETRIC SCIENCE.

A. A. Shafik.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial held on Oct. 20th the following degrees and diplomas were conferred:—

M.B., Ch.B.—Max Capcan and B. M. Melmed.

D.P.H.—Lucia L. C. Black, Elizabeth F. M. Clark, Edith E. Cromb, Isabel R. Gordon, Betty M. Kennedy, Mary V. Littlejohn, Ian M'Cracken, B. C. Mackay, Margaret M'D. Miller, A. L. K. Rankin, I. N. Sutherland, Violet B. Tulloch, and J. M. Watt.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Oct. 17th Mr. Alexander Miles was re-elected President for the ensuing year, Dr. A. Logan Turner Vice-President, and Mr. John William Struthers, Secretary and Treasurer.

The following 27 successful candidates out of 78 entered who passed the requisite examinations on July 16th were admitted to the Fellowship:—

D. A. Abernethy, J. Bernstein, R. E. Buckingham, E. G. Collins, R. C. Craig, B. B. Cadgil, E. J. G. Glass, E. W. Hayward, H. T. Jenning, A. H. Johns, A. E. H. Kendall, A. M. Kulatilleke, G. H. Lee, J. E. S. Lee, D. A. P. Macalister, C. W. R. McCaldin, G. W. M. Paterson, G. Punshon, G. Purdy, W. L. Thomas, T. H. Thorp, V. G. H. Wallace, F. B. Walsh, E. P. Waters, A. H. Winchester, W. W. Woodhouse, and R. E. Yule.

ROYAL DENTAL HOSPITAL OF LONDON.—The annual dinner of this hospital was held on Oct. 20th at the Trocadero Restaurant. Mr. G. G. Campion took the chair, and among the guests were the Hon. Sir W. H. Goschen, chairman of the hospital, Dr. Charles Ripon, Sir Holburt Waring, Mr. W. H. Dolamore, and the Deans of the London and Middlesex Hospitals. After the loyal toasts, Sir W. Goschen proposed the health of past and present students, giving a survey of the life and times of William Harvey. Mr. S. B. Newton and Mr. H. W. Freeth replied for the students, and the Dean, commenting on the progress of the hospital and dental school, said that although the numbers were not quite as large as last year's (108 men, 9 women), the standards of achievement were well maintained. Over 60 per cent. of candidates had succeeded in the examinations, and one student was working for the B.D.S. degree of London University, a qualification for which the school was well able to prepare students. Replying to a suggestion that post-graduate courses should be arranged, he pointed out that courses already existed in radiology and anæsthetics; that general refresher courses would be difficult to hold, but given a sufficient demand would be provided. Mr. G. O. Whittaker proposed the health of the Chairman.

Surgeon-General Percy James Kelly has been appointed a member of the Executive Council of British Guiana.

ROYAL INSTITUTION OF GREAT BRITAIN.—Two lectures on the Mechanism of the Nerves will be given at 5.15 P.M. on Thursdays, Nov. 22nd and 29th, at 21, Albemarle-street, London, W., by Dr. E. D. Adrian, F.R.S.

Colonel Astley Vavasour Clarke, M.D. Camb., has been appointed a Deputy Lieutenant for the County of Leicester.

A CONVALESCENT HOSPITAL AT PRESTON.—A convalescent hospital for men, with 25 beds, has been opened in connexion with Preston Royal Infirmary. It is housed in The Willows, an adapted mansion, formerly the residence of Mr. W. W. Galloway, by whom it has been presented, together with the cost of the alterations and equipment. The house contains Adam and Queen Anne decorations, and the gardens are unusually attractive.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—At the autumn dinner of this society, to be held on Wednesday, Oct. 31st, at 7.15 for 7.30 P.M., at the Langham Hotel, Portland-place, W., Prof. M. Hajek, of Vienna, will be the principal guest. The opportunity will be taken of giving members the latest information about the Bloomsbury site and its use by the University. Those intending to be present should obtain tickets from the hon. secretaries at 11, Chandos-street, W. 1, not later than Oct. 30th.

EXTENSION OF GLASGOW ROYAL INFIRMARY.—Sir John Gilmour, the Secretary for Scotland, has formally opened the last section of the reconstructed hospital. The final part of the scheme, which necessitated the demolition of the famous Lister Ward, has cost between £60,000 and £70,000, but the complete reconstruction, begun in 1905 and interrupted by the late war, has involved the expenditure of £650,000. Two new casualty wards, each for 16 patients, dedicated to the memory of Mr. John Ross, of Lochbrae, a generous benefactor of the institution, have been provided in this final section, together with a Lister Lecture Theatre holding 160 students, built on the site of the Lister Ward, with a commemorative inscription.

LIVERPOOL ANNUAL MEDICAL SERVICE.—This service, held in Liverpool Cathedral on Sunday, Oct. 14th, was attended by the Lord Mayor (Miss Margaret Beavan) and a large number of medical men and women of whom 60 were in robes and formed a procession. The sermon was preached by the Bishop of Liverpool, who dwelt on the importance of joining the spiritual and psychological with the medical in the processes of healing in accordance with Christ's double command to preach and to heal. He also spoke of the wrong attitude which some people had towards disease and pain. He considered that it was not God's will that people should suffer. The lessons were read by Dr. Murray Cairns and Dr. Bernard Chavasse, and a collection of about £97 was taken in aid of the Royal Medical Benevolent Fund.

LONDON HOSPITAL DINNER.—Dr. Lewis Smith presided over the annual dinner at the Trocadero Restaurant on Oct. 18th, when there was a large gathering of old students of the hospital. The guest of the evening was Lieut.-Colonel W. M. Pryor, chairman of the College Board, and messages were read from Lord Knutsford and others who were prevented from attending. After the loyal toast had been honoured, and the toast of H.M. The Queen as President of the Hospital, Dr. Lewis Smith gave a racy account of recent travels in various parts of the world, including Whitechapel. On a visit to the hospital he had ascertained that there were still two or three uncured members of the race which is dominant in that neighbourhood, and he had been lucky enough to meet many of those who were still working there. His description of their activities was much appreciated by the company, as also was the account he gave of London Hospital men whom he had met during a voyage round the world. It was very satisfactory, he said, to find in all sorts of remote places that there was always a London Hospital man, that he was making good, and that the memory of the hospital was a constant stimulus to the best possible work. Dr. Lewis Smith admitted that he had contracted severe "Imperialitis" as a result of the kindness and hospitality everywhere received. The health of the chairman was proposed by Dr. Russell Andrews, who spoke, as an old but discreet friend, of his admirable qualities as a fellow student, colleague, and holiday companion. The toast was drunk with great enthusiasm, and evoked a brief but entertaining response. The party then exchanged its symmetrical arrangement for one more in keeping with unrestricted conversation.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY, Nov. 1st.—8.15 P.M., TROPICAL DISEASES. Presidential Address: Dr. J. B. Christopherson: A National Outlook of Tropical Medicine. Paper by Dr. J. G. Willmore.

FRIDAY.—10.30 P.M. OTOLOGY. (Cases at 9.30 A.M.) Presidential Address by Mr. Somerville Hastings. Dr. J. Kerr Love: A Classification of Deafness Based on the Effect of Deafness on Efficiency in Life. Dr. T. A. Clarke: On Hearing Tests. Cases and specimens will be shown by the President, Mr. E. D. D. Davis, Mr. Norman Barnett, and Mr. H. Graham Hodgson. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Presidential Address by Mr H. Bell Tawse. Cases will be shown by Mr. Herbert Tilley, Mr. C. A. S. Ridout, Mr. H. Lawson Whale, Mr. W. M. Mollison, and Mr. Harold Kisch. 8.30 P.M., ANÆSTHETICS. Mr. I. W. Magill: Endotracheal Anæsthesia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

THURSDAY, Nov. 1st.—5 P.M., Dr. A. G. Gibson: Pyelitis and Pyelonephritis (Bradshaw Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 29th.—5 P.M., Mr. T. W. P. Lawrence: Demonstrations of Surgical Specimens.

FRIDAY, Nov. 2nd.—5 P.M., Sir Arthur Keith: The Evolution of the Human Foot and its Bearing on Orthopædic Disorders of the Foot.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 29th, to SATURDAY, Nov. 3rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Lecture by Mr. C. S. Lane-Roberts: Abdominal Pain in Pregnancy, on Mon. at 5 P.M. HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. Tues. at 2 P.M.: Clinical Demonstrations by Mr. Lionel Colledge. WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M.: Demonstration by Dr. S. H. Daukes on Diet and Disease. The above are free. HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Practitioners' Course for two weeks in medicine, surgery, and the special departments. 4.30 to 6 P.M. daily. Clinical Demonstrations and lectures.

UNIVERSITY OF LONDON, South Kensington.

MONDAY, Oct. 29th, to THURSDAY, Nov. 1st.—3.30 P.M., Second International Conference on Light and Heat in Medicine and Surgery. Conference Programme on application to the *British Journal of Actinotherapy*, 17, Featherstone-buildings, London, W.C.1.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 29th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Trevor Davies: Gynæcological Diagnosis.

THURSDAY, Nov. 1st.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

UNIVERSITY OF LONDON SEMON LECTURE.

THURSDAY, Nov. 1st.—5 P.M. (in the Barnes Hall of the Royal Society of Medicine), Prof. Markusz Hajek, of Vienna: Laryngo-Rhinology and General Medicine.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Oct. 29th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Third lecture.)

FRIDAY, Nov. 2nd.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Fourth lecture.)

5.30 P.M., Dr. J. Owens, A.M.I.C.E.: Smoke Pollution of the Air and Public Health. (First of three public lectures.)

LONDON HOSPITAL MEDICAL COLLEGE.

FRIDAY, Nov. 2nd.—4.15 P.M. (in the Bearsted Clinical Theatre), Dr. Cecil Wall: Expectoration. (Schorstein Memorial Lecture.)

EAST LONDON HOSPITAL FOR CHILDREN, Glamis-road, Shadwell, E.

WEDNESDAY, Nov. 7th.—4 P.M., Clinical Demonstration on Nephritis in Childhood. Free to medical practitioners.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 1st.—4 P.M., Dr. Hutchison: The Dyspepsias of Childhood.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 30th.—3.15 P.M., Dr. E. G. B. Calvert: Modern Methods in Liver Disease.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

WEDNESDAY, Oct. 31st.—4.30 P.M., Mr. Claude Mills: Some Interesting Urological Cases.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 29th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY, Nov. 1st.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 30th.—5 P.M., Dr. K. Sibley: Principles of Treatment. Local.

THURSDAY, Nov. 1st.—5 P.M., Dr. A. M. H. Gray: Streptococcal Infections.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

TUESDAY, Oct. 30th.—4 P.M., Dr. A. T. Henderson (McGill University): Studies in Asthma and Related Diseases, (Third Harben Lecture.)

WEDNESDAY.—4 P.M., Dr. S. W. Fisher: Pains and Pleasures of a Miner's Life.

UNIVERSITY OF BRISTOL.

TUESDAY, Oct. 30th.—8.30 P.M., Dr. J. Odery Symes: The Relation of Erythema Nodosum to Tuberculosis and other Diseases. (Long Fox Memorial Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 30th.—4.15 P.M., Mr. E. D. Telford: Thrombo-angiitis Obliterans.

FRIDAY, Nov. 2nd.—4.15 P.M., Prof. J. S. B. Stopford: Intracranial Pressure.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Nov. 1st.—3.45 P.M., Mr. Diggle: Minor Operations of the Ear, Nose and Throat.

Appointments.

DRAKE-BROCKMAN, R. E., M.R.C.S., L.R.C.P., has been appointed Medical Referee under the Workmen's Compensation Act for Clerkenwell County Court.

FULLER, C. B. S., M.D., B.Ch. Camb., M.R.C.P. Lond., Honorary Physician in Ordinary to the Royal Hampshire County Hospital, Winchester.

HANCOCK, A. C., M.B., B.S. Lond., D.P.H., D.P.M., Medical Superintendent, Kent County Mental Hospital, Barming Heath, Maidstone.

SMITH, H., M.B., Ch.B. N.U.I., Medical Officer of Health for the Rural District Council, Bury.

WALKER, G. F., M.D. Leeds, M.R.C.P. Lond., Medical Tutor in the University of Leeds.

St. Thomas's Hospital: ROBINSON, A. B., M.B., B.S. Lond., Resident Medical Officer, St. Thomas's Home; ODDIE, R., B.M., B.Ch. Oxf., Senior Casualty Officer, Medical; and TUCKETT, C. I., M.B., B.Chir. Camb., Senior Casualty Officer, Surgical.

Westminster Hospital: WELLS, H. G., L.R.C.P. Lond., M.R.C.S., and MCLAREN, K. M., L.R.C.P. Lond., M.R.C.S., Resident House Physicians; EDWARDS, W., L.R.C.P. Lond., M.R.C.S., COOPER, T. V., L.R.C.P. Lond., M.R.C.S., and LESLIE-SPINKS, A. J., M.B., B.Ch. Oxf., Resident House Surgeons; BROWN, H., L.R.C.P. Lond., M.R.C.S., Resident Obstetric Assistant.

Surgeons under the Factory and Workshops Acts: RANKIN, A. K., M.B., Ch.B. Glasg. (Aspatria, Cumberland), and MACPHERSON, J. M., M.B., Ch.B. Glasg. (Loughor, Glamorgan).

Vacancies.

For further information refer to the advertisement columns.

Barnsley County Borough.—Asst. M.O., &c. £600.
Birmingham City.—M.O. for Maternity and Child Welfare. £600.
Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.
Birmingham City Hospital, Little Bromwich.—Third Asst. M.O. £350.
Bury Infirmary.—Sen. H.S. Also 3rd H.S. At rate of £200 and £150 respectively.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff, Prince of Wales' Hospital.—H.S. £120.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—2nd Res. H.S. £75.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chester Royal Infirmary.—Honorary Surgeon.
Chesterfield Borough.—M.O.H. £900.
Chesterfield and North Derbyshire Royal Hospital.—Res. Surg. O. £300.
Croydon General Hospital.—Hon. Phys. for Diseases of the Skin.
Dumfries and Galloway Joint Sanatorium.—Res. Med. Supt. £600.
East Ham County Borough.—Asst. M.O. £600.
Frimley, Hospital for Consumption Sanatorium.—Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Huntingdon County Hospital.—H.S. At rate of £100.
Leicester Royal Infirmary.—2nd Res. Anæsthetist. At rate of £250.
Liverpool, Hahnemann Hospital.—Hon. Medical Officer for Light Department.
Lowestoft, St. Luke's Hospital.—2nd Asst. M.O. £550.
Manchester Royal Infirmary.—Sen. Asst. M.O. (Part-time). Also Jun. Asst. M.O. for Radiological Department. £105 and £350 respectively.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. £100.
National Hospital, Queen-square, W.C.—Registrar. £200.
Norwich, Norfolk and Norwich Hospital.—H.S. to Ear, Nose and Throat Department. £120.
Nottingham, General Hospital.—H.S. At rate of £150.
Nottinghamshire County Council.—Tuberculosis Officer. £750.
Penshurst, Kent, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Jun. Res. M.O. £350.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. Also Hon. Dental S.
Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. Each at rate of £100.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.
Royal Free Hospital, Gray's Inn-road, W.C.—Radium Officer (Part-time). £100.
St. Thomas's Hospital, S.E.—Asst. Pathologist. £450.
Salisbury General Infirmary.—Res. M.O. £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. £100.
Stroud, Glos., Stroud General Hospital.—H.S. £120.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Newnham (Gloucestershire).

The Ministry of Labour for Northern Ireland announces a vacancy for a Medical Referee under the Workmen's Compensation Act (Northern Ireland), for the County and City of Londonderry. Applications should reach the Ministry of Labour, Ormeau-avenue, Belfast, not later than Nov. 10th.

Births, Marriages, and Deaths.

BIRTHS.

TICEHURST.—On Oct. 20th, at Saxon House, Appledore, Kent, the wife of Dr. Claud B. Ticehurst, of a daughter.

MARRIAGES.

PENROSE—LEATHES.—On Oct. 17th, in London, Lionel S. Penrose, M.A., M.R.C.S., to Margaret Leathes, M.A., M.R.C.S., only daughter of Prof. J. B. Leathes, F.R.S., and Mrs. Leathes, of Manchester-road, Sheffield.

DEATHS.

MCNICKLE.—On Oct. 14th, at St. Thomas's Nursing Home, Andrew John McNickle, L.R.C.P. & S. Edin., of Harleyford-road, S.E.

ROUND.—On Oct. 11th, at "Purbrook," Crescent Wood-road, Sydenham Hill, S.E., John Cornwell Round, M.R.C.S., L.R.C.P., aged 63 years.

WEAKLEY.—On Oct. 18th, at Melbourne-road, Ilford, Dr. S. J. J. Weakley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

OVERCROWDING AT SHEFFIELD INFIRMARY. — So seriously overcrowded is Sheffield Infirmary that in the children's ward patients are sleeping two in a bed, whilst in adult wards a number of patients have to sleep on beds made up on the floor. There is a waiting-list of several hundred medical and surgical cases. A new infirmary is being built.

Notes, Comments, and Abstracts.

NERVOUS DISEASE AND ITS SIGNIFICANCE IN INDUSTRY.*

BY MILLAIS CULPIN, M.D. LOND., F.R.C.S. ENG.,
LECTURER IN PSYCHONEUROSES AT THE LONDON HOSPITAL.

I TAKE as an introduction to this paper some sentences from that read at your last conference by Miss G. F. McArthur, who spoke of "nervous complaints which comprise a group of disabling sicknesses arising from no structural cause that can be detected, but which express themselves in weakness, instability, or exhaustion of the nervous system." She went on to refer to the cost to industry of this group and its effect in impairing mental and physical efficiency, and added that "a close scrutiny of the incidence of neurasthenia, nervous breakdown, nervous depression, and nervous exhaustion will reveal that these complaints are associated with fatigue, anxiety, monotony, incompatible work, insufficient rest, and perhaps with unduly severe or unsympathetic supervision."

These words refer to conditions but little understood and, in spite of their prevalence, neglected in the health propaganda that is now rightly popular. Their extent can only be guessed at. The medical officer of one large firm wrote to me about "the total of vague illness in which I include anæmia, gastric, neurasthenia, nerves and general debility," and this should be compared with Miss McArthur's reference to "anæmia, debility, and nervous complaints; a family of relevant disabling causes which are most directly aggravated, if not directly induced, by the conditions under which work is done." I must, however, criticise her remarks that "anæmia, for example, is a sickness definitely associated with an insufficient absorption of oxygen, with inappropriate or inadequate diet, with close confinement in bad air, with bad natural lighting, and with lack of sunshine and outdoor exercise to counteract the effects of occupation." Anæmia, or chlorosis, was in my student days a common and well-defined condition marked by a loss of the colouring matter of the blood, most frequent among ill-fed and overworked girls in large towns, but seen also under other conditions. There are other comparatively uncommon forms of anæmia, but this one has completely disappeared—why, we cannot say. The anæmia of our sick returns corresponds to no definite picture; it generally means only that the patient looks and feels ill. Sick returns show large numbers of cases in which the diagnosis is obviously based upon no definite evidence of physical illness, and since nervous illness usually presents no physical signs it is often to be looked for among these cases. Bearing this in mind, we will now glance at some of the few available figures.

Dr. Letitia Fairfield, in a paper in THE LANCET (1926, ii., 5–10), showed that over one-fourth of all long sick leave in a large group of female school teachers was due to these nervous disorders and, for the reasons given above, this must be considered as a minimum. From the annual sickness records of one firm I will read you the details of seven cases out of the first twelve:—

	Days lost.
Influenza, influenzal debility, nervous debility, nervous exhaustion, influenza	159†
Nervous debility	124
Dyspepsia and nervous debility	278
Cardiac and nervous overstrain	109
General debility	105
Debility	94
Nervous breakdown	123

† In separate periods.

These seven, out of the total of 12, come under the head of "nervous" or "debility." Any series of 12 would give the same general picture. The workers were reasonably well paid, their working conditions were hygienic, and I do not think they were excessively driven at their work. Their days lost per head per annum from sickness were 7·7 for men and 14·1 for women.

In another firm, with a sick-rate of 3·6 days for men and women, these nervous conditions were quite absent except for two cases of influenza where the length of illness suggested a possible nervous element. The difference in days lost was due almost entirely to the group of "debility and nervous."

A disconcerting feature is that these illnesses are, contrary to a priori beliefs, not characteristic of firms where hygienic conditions are bad or where work is strenuous. The highest sick-rate I know is in an establishment that rightly prides itself upon its care for the welfare of the workers; the lowest is in a large general store where conditions are

* A lecture delivered at the Conference of the Industrial Welfare Society, Balliol College, Oxford, on Sept. 8th, 1928.

reasonable but which has a reputation for getting plenty of work out of its employees. I am assured, however, that the low sickness-rate is not due to harshness. These two firms offer a curious contrast in one particular illness. Dysmenorrhœa, or painful menstruation, is a disorder with, usually, no objective evidence for its existence and is now coming to be regarded as belonging to our group of nervous illness. The general sick-rates are, roughly, 15 days for females in firm A and 2·6 for both sexes together in firm B. In firm A 14·9 per cent. of their high sick-rate is due to dysmenorrhœa; firm B, at my request, took out the figures for dysmenorrhœa and, by adding in the hours spent in the sickroom, brought up the total to from ½ to 1 per cent. of their low sick-rate. Doubling this, since about only half the staff are women, a little calculation shows, in spite of some difficulty in the figures, that firm A has about 40 times the sickness from dysmenorrhœa that firm B has.

We have, then, conditions called neurasthenia, nervous breakdown, nervous debility, and such like, and in addition a group of ill-defined conditions appearing under other names but really identical with these or dependent upon them.

What is Nervous Illness?

We use a vocabulary based upon the belief that in these conditions our nerves are "out of order." But we know nothing in this connexion about the state of those anatomical structures called nerves, and our phraseology is metaphysical. We live and have our being through our nervous system, and we must believe that every thought, impulse, or emotion is related to something happening in that nervous system. But when we consider the behaviour of an individual we think of various thoughts, feelings, and desires that we recognise in ourselves and assume in others, and the disorders we are discussing can be usefully considered only as alterations in the behaviour or feelings of the person as a whole; not as hypothetical changes in some of his anatomical constituents. There is involved here no antithesis between body and mind; bodily conditions can influence mental states, and mental states can influence bodily function.

This latter process needs emphasis. Some may have experienced fear or apprehension and may recall the beating heart, the dry mouth, the rapid breathing, and the abdominal discomfort, or, if the situation were prolonged rather than acute, the loss of appetite and sleep, the incapacity for bodily or mental exertion, and the sense of physical ill-being. The bodily expression of the emotions is not always, and is never only, a matter of muscular activity; its constant elements are changes in the activity of our glandular and other organs. The "gastric" group in sick returns includes such changes, and many people, young and old but mostly young, nurse as weak hearts organs that are only emotionally disturbed. There are obvious physical illnesses, including asthma, mucous colitis, and some skin disorders, in which some of us suspect an emotional basis; but this is beside our subject.

It will be realised, when I give actual examples, that what we call nervousness is to a great extent a liability to experience the emotion of fear in circumstances that should not arouse that emotion. The chapter in Samuel Butler's "Erewhon" will be remembered where he describes the stigma attached to bodily disease, and the very guarded way in which the local practitioners approach the possibility of there being perhaps a slight physical disturbance to account for the patient's symptoms. To us, of course, inexplicable nervousness is shameful, whilst an inexplicable bodily symptom calls for sympathy and attention. Hence the nervous subject tends to seek refuge from our judgments in the physical symptoms that his nervousness provides. Further than this, he frequently avoids his own judgment by denying to himself the existence of fears or emotional stress so long as his physical symptoms enable him to escape the situation that arouses them.

We take for granted that a man knows little about what goes on inside his body; but we have assumed that we know all that takes place in our minds, and we dislike to admit that our thoughts or feelings or emotional reactions are not wittingly determined by ourselves. It is now believed, and the belief is not the result of theorising but of investigation, that complicated mental processes take place in all of us that are not accompanied by awareness. The reactions of the nervous subject are determined by such processes, and only this knowledge can make intelligible his apparently irrational and meaningless symptoms. This knowledge also warns us that to measure them by the standards of consciously motivated behaviour is futile.

I must in fairness present the theories that attribute these conditions to primarily physical causes. They appear in several forms. The simplest attributes nervousness to some actual disease, the absorption of poisons, for example, from an unsuspected focus of infection. There is this much in its favour, that any bodily discomfort, especially the general malaise that arises from such causes, adds weight to nervous symptoms that might otherwise lead to little discomfort. A nervous patient with a focus of infection should have it treated; and so should a patient who is not nervous. The next form of theory postulates changes in those endocrine glands about which we have in recent years learnt a great deal and speculated still more. They are concerned with temperament and emotion and it is possible that a primary disturbance of them may render emotional reactions unstable. But experiment and experience—particularly war experience—show that emotion affects the glands rather than that the glands affect emotion. Moreover, nervous fear is specific—a man may fear to cross a field alone and yet deal effectively and calmly with real danger, so that it is plain that here there is no general tendency to feel fear such as would arise from excess or deficiency of glandular activity.

Yet another form of the physical theory is associated with the name of Adler, who believes that some parts of the body are poorly developed and that this inferiority leads to symptoms arising from the organs concerned. This "organ inferiority" is perhaps a part of the picture in some cases. Least useful is the belief about our nerves being out of order, by which we avoid so many difficulties.

Certain outside influences are assumed to cause nervous illness and call for brief criticism. Overwork and strain stand first in the popular belief, but I agree with Dr. Fairfield, who, in the paper already quoted, shows by actual cases that the easy acceptance of such explanations hides the fact that these causes by themselves are harmless. Physical fatigue, even when severe, is quickly recovered from, but we see cases in which an ordinary vocation is supposed to produce states of exhaustion that need months for recovery. Hard work never caused nervous breakdown; the words overwork and overstrain really refer, not to the work, but to the reaction of the subject in regard to it. Worry is another word that, taken to refer to outside factors, really indicates something arising within the subject; the nervous subject must worry because he is nervous, he is not nervous because he worries. Monotony is another scapegoat, but whenever I seek for the meaning of the word I find that it refers not simply to repetitive work—which is agreeable to many people—but to repetitive work that is distasteful. Noise is receiving attention now and many letters have appeared in the press claiming that it causes nervous breakdown. Of that there is no evidence, and on systematic questioning I find that the man who protests about noise presents other nervous symptoms. The emotionally stable man can adjust to noise very quickly. All we know is that to some nervous people some noises are very distressing; that may be a sound argument for diminishing noise—I hate some noises myself—but that by some direct action upon nerves it causes breakdown is a speculation outside the realms of physiology.

I do not suggest that we should not eliminate overwork, monotony, and noise; they are disagreeable things and serve as pegs upon which the nervous subject hangs his symptoms. But there is no evidence that occupations in which these factors play a part show a higher nervous sick-rate than others, and there is at least some evidence in the contrary direction.

In order to complete this survey I will add that I regard nervous states as having their origin in those early years of life in which our character traits and emotional modes of reaction are determined. If they mature as illness it is because of some difficulty in emotional adjustment to the demands of life.

The Incidence of Nervousness.

In the absence of systematised information about the prevalence of nervous illness, the Industrial Fatigue Research Board has arranged an investigation in the course of which I have, in collaboration with Miss May Smith, interviewed over a thousand volunteers, workers in various occupations, with the aim of learning what we can about nervous illness in industry. Here is an example of what can be learnt in a 20 minutes' interview:—

Female clerk aged 33. Dislikes the work. A month ago was away for nerves. Had made a mistake and it worried her. Always had feared the dark or being alone. Nervous if spoken to by strangers. Cinemas try her eyes. Has good and bad days; no energy, but improves as the day goes on. Has a feeling of "something awful going to happen—a cloud." Tennis is too much for her; influenza left her heart weak. (Asked how that showed itself—goes faint in trains or crowds.) Could not sit in a small room like this; it would make her come over all faint. No, not frightened at all; its the heart. Wears glasses (0·25 plus cylinders) to avoid strain and headache. Had all her teeth out for gastritis before the age of 21. Does not look forward to keeping on at this work.

We see here the influence of nervousness upon physical symptoms. The gastritis is the "gastric" of my medical correspondent. The heart symptoms are the result of emotion; her inability to sit in a small room is what is called claustrophobia, but the fear is disguised as a heart symptom. The wearing of very weak glasses for eyestrain is a hallmark of the nervous subject. All her physical troubles are excrescences upon a basic nervousness, and the history is so typical of what can be obtained from sufferers

from nervous breakdown that it is very probable that a nervous breakdown will be her fate. Meanwhile her work suffers and she adds to the already high sick-rate of her firm.

The next case, though showing symptoms equally severe, is a curious contrast from the industrial aspect:—

Female laundry worker, aged 34, married, four children. Likes the work very much. Would not change if given the chance. "My nerves are all bad. The least worry makes me go all of a shake. I worry at the least thing. I'm afraid in the dark or of being alone. Wouldn't go along a dark road." Describes claustrophobia. "Should worry and fidget in this room." Never goes in a bus; wouldn't go alone in a train; feeling of being observed; never goes out by herself. She has to find a companion to accompany her to work. A summons to see the manager would make her go all hot. "All of us have been born with nervous debility." Never goes to the pictures. Is asocial.

Here you see no camouflage. The nervous symptoms appear frankly as such; but the woman is an efficient worker, she has no sick leave from nervous illness and her employers have no suspicion that she is different from other people.

These two examples demonstrate one important principle: nervous symptoms need not mean industrial disability. The first subject is in an occupation with fair security of tenure, with the ordinary pay of clerical work, short hours, and hygienic surroundings. The second is in an ordinary laundry; her hours are longer; one would say her surroundings are less hygienic, they are certainly less up to date than the other's; she works subject to a week's notice, and has the cares of a household in addition to her work.

Laundry workers show as high a percentage of nervous people as clerical workers in private firms or Government employ; but the incidence of nervous illness in two laundries investigated is so low as to be incalculable. One factor may be the satisfaction of the workers with the work. I start my interviews with the question, "How do you like your work?" and the answers to this conversational gambit provide, so far, the only definite correlation with the incidence of nervous disability. In the laundries over 90 per cent. declare they would not change their occupation if they had the chance; in clerical occupations the percentage varies from 54 to 84. In only one establishment was everyone satisfied; that was a school of dramatic art where in the nature of things choice had been free, free even from effective economic pressure. Only 32 per cent. of the students failed to reveal symptoms at the interview and 25 per cent. were assessed at high figures—we have all heard about the artistic temperament, and now I know what it is as expressed in symptoms. No sickness records were kept, but I could find no hint of absence through nervous illness. The nervous breakdowns will come later, when life has become strenuous.

What is the prevalence of nervous symptoms? This is hard to say, for one cannot obtain an experimental group representative of the general population. The element of personal judgment, too, is sure to enter, but my findings have been checked by Miss May Smith, working with the McDougall-Schuster dotting machine, which is an objective test giving results in general agreement with my own, though in individuals they are not sufficiently uniform to be used independently. I find that I pass as free from symptoms less than 50 per cent. of my subjects, about 25 per cent. have one or two minor symptoms, another 25 per cent. have symptoms that interfere with happiness or efficiency, and from 5 to 10 per cent. are seriously in need of treatment. In a few cases I have suspected that the subject was on guard against revealing what he might consider his weaknesses, and this suspicion has invariably been confirmed by a poor performance at the dotting test. On the other hand, I am often thanked for listening to troubles that the sufferer has hitherto kept secret and perhaps exaggerated in importance. It is always understood that the interview is confidential.

Temperamental Qualities Affecting Efficiency.

If the occupational environment is favourable, symptoms may have no direct relation with efficiency; our laundry woman's fears, for example, did not interfere with the day's work. But some nervous tendencies have a direct effect upon work, or, what is perhaps more important, upon relations with fellow workers, subordinates, or superiors. It will be remembered that one case-history made mention of "good and bad days." Perhaps most of us have days when, as the old saying puts it, we seem to have got out of bed the wrong side, and in the nervous subject these "bad days" are often marked by the feeling of impending disaster, though objectively they are characterised by obvious irritability and uncertainty of emotional reaction. Sometimes they affect the quality and quantity of the work done, and actual records showing work curves in nervous people have demonstrated this effect.

A dislike to being watched causes embarrassment and clumsiness. A clinic patient of mine told me how, when engaged at polishing the inside of aluminium horns for loud speakers, he said to a foreman. "If you stand and watch me like that there will be an accident." The foreman reported him for impudence, but the manager—whose insight suggests some nervous symptoms in himself—accepted the man's explanation and ordered that the foreman should refrain from watching him. This dislike is more common and intense than might be suspected; there are men apparently quite ordinary who will rather go hungry than enter a teashop alone because of the feeling that all eyes are upon them. An impulse to rush one's actions may have a relation to accidents. One patient assured me that he knew he would break his neck some day whilst cycling, because of such an impulse. Among his other symptoms was telegraphists' cramp, which was largely determined by this inability to "take his time over it."

Scrupulousness, whilst estimable within limits, is carried sometimes to extremes and appears as fuss or worry. A constant and harassing fear of mistakes leads to mistakes and unnecessary repetition of work; worrying as to the opinion of others fetters action and judgment. Self-criticism passes on to uncertainty, till in extreme forms the subject is tormented with an inability to believe that he has done what he knows he has done. Unfortunately, this over-scrupulousness does not diminish with age and what may have been a useful, though not unmixed, quality in a subordinate becomes a nuisance when the afflicted one reaches a position of authority. We have had a practical demonstration that a personal factor of that nature can affect sickness-rates in subordinates. Here let me observe that in this nervous world of ours the absence of nervousness in a principal, if accompanied by a misunderstanding of and contempt for the nervous ones, may be as disastrous. A mild degree of nervousness, if accompanied by insight, may actually be an advantage in handling people.

There is one interesting type called "obsessional" in which the symptoms are primarily on the intellectual level rather than the emotional. (The word *obsession* has here a specific meaning different from the loose meaning popularly given to it. It indicates a compulsion recognised by the patient as irrational.) These people may appear quite free from symptoms, even to their intimates, or may be regarded as highly strung. They are often remarkably efficient, standing out from other people by their performances at the dotting test, in which they excel the humdrum folk who are free from symptoms. They may be tinged with over-scrupulousness and they sometimes suffer from anomalous physical symptoms—I should expect them to be subject to troubles like writer's cramp—and of course nervous breakdowns come their way. They reach high positions but, I think, stop short of the highest. As an example of obsessional symptoms I will mention a girl of 20, tall and a fine physical specimen, who said, "I dissect my actions and then dissect the dissection. Its a vicious circle till I nearly go mad. I try but can't stop." In another case a man gave up playing chess because of an obsession so to arrange himself in relation to other people that their relative positions formed the knight's move. This man made an outstanding record at the dotting test, which has been approached only by a fellow obsessional; it was far and away superior to the dotting of any non-nervous person.

But I wish on this occasion to stress the unity of nervous states rather than their clinical varieties. Let me build a composite picture: A man who has always been afraid in the dark; who says he was put off games at school because of his heart, but is now passed as a first-class life; who goes all of a shake if the manager sends for him; who sometimes has a feeling that something dreadful is going to happen but does not know what; who suffered from nervous debility for three months after influenza; who cannot bear to sit in the first row of the gallery at a theatre; and, finally, makes a bad show at the dotting test. He is perhaps carrying on his work without anyone suspecting his nervous condition. But if he became a soldier and went up the line he would have shell-shock; at the base he would suffer from gastritis or a strained heart; if he were a workman and met with an accident he would suffer from traumatic neurasthenia; if a business man and life became too difficult he would have a nervous breakdown; if a telegraphist he would develop cramp; if a miner he would have nystagmus and become a subject for compensation. The form and title of the symptoms would be determined by fortuitous circumstances, but the foundation would always be the same. He could only come through without serious trouble if life ran smoothly. And for some nervous people life never can run smoothly.

The Dilemma in Handling Nervous Disability.

When dealing with cases of shell-shock I came to the belief that every man, if exposed indefinitely to modern warfare, would reach breaking-point; but a statistical study of 450 cases showed a close relation between the degree of predisposition, as revealed by the search for antecedent symptoms, and the length of service before breaking-point was reached. In civil life we meet the same two factors—

predisposition and stimulus; bear in mind that predisposition is a difficulty in adapting to the demands of life and that the outbreak of disabling symptoms is a failure of the attempt to adapt.

I have not yet considered the point of view indicated by the subtle condemnation implied in such a word as *neurotic*, from which the nervous subject is regarded as being in some way responsible for his symptoms. There is this much truth in it, that the disability rescues the subject from the stimulus that produced it; in the case of shell-shock the rescue was so obvious that to the tough-minded shell-shock, as soon as its mental nature was recognised, was only malingering. The nervous subject is not aware that one factor in his illness is the escape from an intolerable position. Moreover, the position is intolerable not necessarily for material reasons but because the man is already nervous: something is hitting him and he does not know what. The man who knowingly feigns a disability to escape the materially intolerable, discards the symptom when he succeeds. The nervous man finds an ordinary situation of life intolerable, is rescued from it by an exacerbation of his symptoms, and may remain ill and unhappy.

We have to regard the escape from some stress as a factor in nervous disability. If we make the way of escape easy we introduce another mental process that aids the development and perpetuation of symptoms. Yet the sense of duty may be stronger in the nervous than in the healthy—I have already described over-scrupulousness as a nervous symptom. Many nervous folk carry on under great difficulties, but others are ready to throw in their hands at the first opportunity. If upon every nervous patient were forced the alternatives of work or starvation, many who now succumb would find salvation in work; but others would starve and some might find a speedier end. Every case is a special problem, and I am now taking only one aspect, which is not always present; plenty of cases exist apart from any question of work, but we are faced by the difficulty that the nervous subject needs help and may be unable to work on account of his symptoms, whilst if we make easy the escape from effort—whether by sick pay or compensation—we may perpetuate the trouble in the individual and increase it in the mass.

This aspect is important in what are called the occupational neuroses. Miner's nystagmus, in my opinion, belongs to this group, and it has increased alarmingly of late years till the annual amount now paid in compensation is over half a million. That the influence of compensation is becoming recognised is shown by statements made in the House of Commons by Dr. Vernon Davies on July 11th last. He noted that the figures were going up in this country, where compensation lasts indefinitely, but that there was not the same rate of increase in Belgium, where compensation ceased after a definite period and for some remarkable reason the patients then improved.

The Handling of the Nervous Individual.

If my point of view is correct, the commonly assumed causes of nervous illness lose much of their significance and each case becomes a problem of personal adjustment. As in physical disease, the influence of working conditions may be less than that of home conditions, for domestic and family life call for even more adjustment than the working life. Every case is a special problem and the welfare worker may be in a better position to help than the doctor. That help must be guided by understanding, and the first essential is the recognition that nervous symptoms are not the result of "imagination" but, as far as the sufferer is concerned, are as real as toothache. One must be prepared to listen to absurd symptoms, to stories of apparently unreasonable emotional reactions, and to listen without expressing moral or intellectual judgment; and that means without feeling it, for the over-sensitive subject is quick to sense judgment and to withhold confidence if he detects it. The telling of nervous symptoms hitherto concealed does good—never harm—and paves the way to the discovery of current stress which, however, as a cause of his trouble, the patient tends to put in the background in favour of some of the more popular explanations. The recognition by the patient that his illness is an emotional reaction against some stress is often enough to end it; but the question may arise how far he should be encouraged to ignore his symptoms and carry on, or what material concessions should be made; certainly any concessions that would be reasonable in the case of a healthy man. The matter of sick leave is the concern of the doctor, but sick leave without an attempt to find out the why of the maladjustment is a mistake.

These principles will serve in many cases. There will remain others where the nervous reactions are of too severe a nature to be handled without more specialised knowledge.

Conclusion.

Work upon this subject is only beginning and easy explanations and solutions are dangerous. So many of my own ideas have been falsified that I hardly like to express opinions that await confirmation. I will offer one generalisation: rigidity of conditions of employment appears to favour the outbreak of nervous disability. That effect of rigidity seems likely if difficulty of adaptation is the key to nervous illness, and the supposition is to some extent justified by our findings. We already treat as a truism the proposition that the happiness and contentment of the worker depend upon physical health; but body and mind are perhaps only two aspects of one vital process, and it should be a truism that the physical health of the worker depends upon happiness and contentment. In the nervous subject happiness and contentment are difficult of attainment, and we may find in his reactions a delicate indicator of unsuspected evils that may be affecting his fellows in a less degree.

IMMUNISING DOGS AGAINST RABIES.

IT was mentioned in the *Times* of Oct. 17th that a large Alsatian, owned by a European, recently developed rabies at Mussoorie, and that several persons who had been bitten by the dog were sent to the Pasteur Institute at Kasauli. The collector has announced that all dogs at large unmuzzled shall be immediately destroyed. In this connexion it is interesting to learn from the *Military Surgeon* for September (p. 435) that the Adjutant-General, on the recommendation of the Surgeon-General, has directed that, during the next ten years, all dogs kept on nine military reservations shall be yearly immunised against rabies by a veterinary officer, at the expense of army funds, in order to determine definitely what benefit is to be derived from canine immunisation. In one of these reservations in 1927 15 persons were bitten by rabid dogs.

CORED CARBON ARCS.

THE cored carbon electrode is a hard carbon rod with a central core containing one or more metallic compounds. In the heat of the arc this metallic filling is volatilised and the radiation emitted contains a spectrum characteristic of the metals present in addition to that of the normal carbon arc. Cored carbons are usually cheaper if used in preference to the corresponding metallic electrodes as they are steadier and as a rule more economical in running. A variety of these electrodes is now available and these differ considerably from one another in the quality of the radiation emitted, some being rich in the short wave-lengths of the extreme ultra-violet, others in the region nearer to the visible spectrum. It is to be hoped that the special therapeutic properties which characterise these different types of radiation may be more definitely established. The Electrical Equipment and Carbon Co., Ltd., have published a leaflet showing the spectra of some 14 varieties of cored carbons made by Messrs. Siemens. In judging their importance it must be borne in mind how greatly the appearance of the photograph of a spectrum can be modified by variations in photographic technique. The photographer's task is here very difficult owing to the immense range of intensities between the strongest and the weakest lines, exaggerated by prolonged development, which no printing paper can render. The print therefore is apt to show groups of strong lines lacking in detail, whilst the fainter lines are lost altogether. Spectra which are to be compared should be recorded on one plate and subjected to the same technique. With cored carbon electrodes in particular the electrical conditions are also of primary importance. If the arc is arranged to consume a small current, the temperature may not be high enough to volatilise the core to any marked degree, especially if it contains metals of high melting points. Again, the radiation from the incandescent electrodes differs greatly from that from the flame of the arc itself where the volatilised core has most effect, so that if the spectrometer has been focused on an electrode rather than on the centre of the arc the spectrum obtained will not do justice to the electrodes under test. Perhaps this may explain the great similarity in the leaflet between the spectrum of tungsten-cored carbon and that of pure carbon. In actual use they are very different.

OUR attention has been called to the programme of a ball given at a West-End hotel in aid of a special hospital, on one page of which are set out the names and addresses of the honorary medical staff of the hospital. We are authorised to state that the staff was not consulted as to the form of the announcement, and would not have allowed their addresses to be so given.

HOSPITAL TICKETS AT RUGBY.—As a consequence of the adoption of the penny-in-the-pound scheme it has been decided to abolish tickets of recommendation to Rugby Hospital. It has been found that the existence of the ticket system deters a certain number of people from joining the scheme.